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THE MORE ABUNDANT DIET[1]

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THE belief of an earlier generation that to eat abstemiously is both spiritually elevating and physically beneficial may under certain circumstances have had in it some element of truth, but under other circumstances, it did great harm. It must be admitted that overeating, with the resulting condition of obesity, carries with it certain well known penalties, such as circulatory impairment, gout, and diabetes mellitus. Evidence of this is seen for example in the observation of Friedrich Müller that the severity of gout was markedly ameliorated and its frequency greatly diminished in the Central Empires during the food blockade of the World War, and in the conclusions of Joslin, Paullin and others that the best means of escaping diabetes is to avoid obesity. But my address today is not concerned with the penalties of obvious dietary excesses or with the necessity for dietary regulation in disorders of metabolism. I wish rather to speak of the illnesses which have been made worse by the injudicious restriction of food and of the benefits which may reasonably be expected from the more abundant diet.

When we consider the illnesses which have been unfavorably influenced by hurtful dietary restriction we think first of typhoid fever. To all of you, I presume, the history of typhoid is an old story, but few of you can hold in your mind's eye, as I can, a picture of the desperately ill state of those early patients who were permitted only a little broth and milk. Compare that picture with the encouraging aspect of the typhoid patients of today who are given a liberal ration which approximates their nutritive needs. The difference is striking, and when we look at the mortality tables this difference becomes graphic.

Less graphic, but nonetheless noteworthy, I believe, is the story now being written of Bright's disease. The discovery that low plasma protein is a salient feature of glomerular nephritis, and the observation of Van Slyke (1) and his associates that a much more favorable outcome can be expected of those patients whose plasma proteins have been maintained at approximately the normal level, introduced an entirely new chapter into the story of this disease. Of interest, too, is the subsequent

[1] Presented before the General Session, American Dietetic Association, Richmond, Virginia, October 19, 1937.

observation of these workers (2) that dogs on liberal protein rations have a higher urea clearance than when the protein intake is low, and the more recent finding of Farr (3) that both the urea clearance and the creatin clearance of children with nephrosis show higher values when they are given more liberal amounts of protein. Following the studies of the Rockefeller workers came the confirmatory reports of McCann (4) and others showing that recovery proceeds more rapidly and more surely in those nephritic patients who are given a liberal protein allowance, something like 150 gm. daily. Fortunately the harm that was done these patients in the past by the injunction "eat no meat, no eggs", was mitigated somewhat by the popular belief that milk was not a protein food and, therefore, could be taken in liberal amounts. Because of the excellence of its proteins milk no doubt saved many a patient with nephritis.

A similar story is being written of essential hypertension and of nephrosclerosis. Neither is primarily a disease of the kidneys and yet the dietary treatment addressed to both in the past was based on the old fallacy of sparing the kidneys. We can agree that moderation in all things should guide the lives of patients suffering from these two diseases, but I am sure that in many cases protein restriction has been carried too far and that the vigor and even the life expectancy of the patient has been seriously impaired. Whatever the influence upon the ultimate outlook, we can at least predict that with the larger amounts of protein now permitted in these diseases, the patient will enjoy greater vigor and will maintain his usefulness for a longer period of years.

We cannot in fairness include in this discussion the harmful effects of starvation in diabetes because it was not until the relatively recent discovery of insulin that we could with any degree of safety permit a more liberal diet. It is proper today, however, to speak of the improvement in vigor and well-being which has come to the diabetic with the more liberal carbohydrate allowance. This more abundant diet of recent years has lessened some of the hazards of diabetes, notably that of early arterial disease, and has greatly extended the patient's usefulness.

More important than treatment is the prevention of disease. In this field of diet therapy two problems have held the limelight, the prevention of dental disease and the avoidance of infection. I dare not speak of the first of these; there is too much difference of opinion and too little positive information. Concerning the second, opinion is more nearly crystallized. The prevention of infection by dietary means has been predicated repeatedly, but a few years ago new light was thrown on the subject by the reviews of Robertson (5) and of Clausen (6). These authors both reached the conclusion, now generally accepted, that while susceptibility to infection cannot be increased by additions to an already abundant diet, resistance may be greatly lowered by deficiencies. It is true that the more recent view of Rinehart and associates (7), that lack of vitamin C plus an infection may be the cause of rheumatic fever, has not been shared by subsequent investigators (8), but good evidence, nonetheless, has been offered in support of the belief that this vitamin plays a rôle in immunologic processes. This is evident in the work of King and

Menten (9) who have shown that vitamin C provides some measure of protection against the toxins of diptheria and other infections, and in the studies of German investigators who find that this factor has a demonstrable influence upon immunologic processes. A similar protective influence can be ascribed to vitamin A and to the vitamins of the B complex. The conclusion to be drawn from all of this is that one way to protect against infection is to take liberal amounts of foods rich in vitamins.

It was only a short time ago that the distinction between minimum and optimum as applied to food was first recognized. Today it is becoming increasingly apparent that even the terms adequate and optimum are seldom synonymous. Repeatedly in animal experiments it has been found that by increasing the amount of a single factor in an apparently adequate diet it was possible to enhance the animal's vigor and well-being. Witness the early experiments of Sherman and MacLeod (10), who gave two groups of rats, identical in all other respects, different diets, the one low and the other high in vitamin A content. Those of the first group reached maturity in apparent health, but they were distinctly less fertile and in early adult life they showed increased susceptibility to infection, particularly to pulmonary disease. Although the type of infection was different, it was noteworthy that pulmonary disease appeared in these rats at relatively the same time of life as in the human subject. The control group, enjoying a liberal intake of vitamin A, grew normally, were successful in rearing their young, and lived, on the whole, about twice as long as the rats whose intake of vitamin A was restricted. Similar results were subsequently obtained by Batchelder (11), whose rats were fed rations of varying vitamin A content through successive generations. It is apparent from her report that the more liberal the intake in this respect the greater the vigor and health of the animals and that the highest degree of vigor was shown by those animals which received an amount of vitamin A four times that necessary to protect against obvious deficiency. This applies to other vitamins as well.

Consider vitamin C, for example. It has been shown that an animal's optimal requirement of this vitamin is several times that necessary to prevent actual disease. Of the guinea pigs given diptheria toxin in the above quoted experiments, those which suffered a partial depletion of their vitamin C reserve, even though this was insufficient to produce signs of scurvy, experienced a material loss in weight and a curtailment in their survival time of 50 per cent. "It is evident from the study that there is a wide zone of vitamin C deficiency, without the appearance of scurvy, where physiological processes are subnormal and the animal is more sensitive to injury from bacterial toxin." Equal claims can be made for the health giving properties of vitamin G. True, nothing definite is known of the effect of the flavins upon man, but the experiments of Sherman and Ellis (12) upon animals showed that increasing amounts of this vitamin in the ration brought about in corresponding degree an enhancement in nutritional well-being and vigor. This improvement in health ascended in a curve parallel to that of the increasing vitamin intake until the animal received an amount of this vitamin four times that necessary to

prevent specific signs of deficiency. It is significant that this improvement in health and vitality was often more pronounced in the second generation than in the first. The word *abundant* as applied to vitamins is assuming new significance.

Of hitherto unsuspected importance are the vitamin reserves which normally accumulate in the animal body. From the above quoted experiments it would appear that retention of a vitamin in amounts considerably in excess of the calculated need will sometimes promote physical betterment to a surprising degree. That such retention occurs in man also is evident in the observations of Knott (13) who found that rapidly growing children retained the maximum amount of vitamin B when permitted an intake of this factor which was six or seven times that necessary to prevent evidences of deficiency. Reasoning by analogy, it seems fair to assume that through such increased retention the child's health benefits in corresponding degree.

Important as are the vitamins, I do not want to make the mistake of laying disproportionate emphasis upon these food factors. Many other nutritive substances, notably proteins, are deserving of like consideration. The word optimum has equal significance, whether applied to proteins, vitamins, or minerals. It is generally appreciated that a certain minimal supply of amino acids in the form of good protein is essential to growth and to the maintenance of what might be called marginal health, but I doubt if it is universally recognized by physicians that a much larger amount is necessary if the animal is to enjoy optimal health. In stressing the necessity for a liberal supply of good protein, attention should be called to the classification of amino acids made by Rose. In his Harvey Lecture he reported that a mixture of all of the twenty-one known amino acids in purified form when used as a substitute for protein would not support growth, and that the nutritive failure of his animals upon the synthetic diets was due to the absence of some unknown substance. Subsequently in his search for this substance he discovered a new amino acid to which he gave the name threonine and which he has identified as the missing growth-promoting factor. He states that when this new amino acid is added to the amino acid mixtures of his earlier experiments the resulting preparation is an excellent substitute for dietary proteins. He divides the amino acids into two groups, the essential and the non-essential, and of the twenty-two amino acids he regards ten as essential. Obviously those proteins which supply these ten essential amino acids in greatest abundance rank highest in the nutritive scale. Just what figure expresses the optimal protein allowance no one has been bold enough to state with finality. It seems to me that we have not yet completely emerged from the era of nutritive economy introduced by Professor Chittenden and I would hazard the suggestion that man's optimal requirement of protein is larger even than we ordinarily assume it to be today.

Another dietary essential, hitherto apparently unappreciated, is now demanding greater consideration—fat. In the effort to provide the patient with an abundance of all dietary essentials and at the same time to guard against obesity, it is the custom of the physician

materially to reduce the fat quota of the diet, but it would now appear that this may theoretically be carried too far. Fats, too, are essential. Pediatrists have known for a long time that the orderly digestion of the infant is dependent upon a certain amount of fat in the diet, and with rats, at least, recent experiments have shown that fat is essential to growth and to well-being. Indeed, Burr and Burr (14) have described a skin disease in rats which accompanies a "fat free" diet, and Evans and associates (15), who confirmed this work, found in addition that successful gestation and lactation were dependent upon an intake of certain essential fatty acids. In the interest of safety, therefore, man should not attempt to eliminate fat entirely from his diet.

The propriety of recommending a more abundant diet in order to reduce the incidence of deficiency diseases might be questioned, for such diseases in their outspoken form are relatively rare in this country. It can easily be demonstrated, however, that vague ill health, the result of nutritive failure, is common, and that the influence of suboptimal diets particularly upon the nervous characteristics of the race is not a negligible one.

A recent study of the pellagrins admitted to the Hillman Hospital in Birmingham during the past fifteen years revealed the startling fact that an appreciable number of these patients had been admitted the previous year under the diagnosis of neurasthenia. But this circumstance is not limited to the miserably poor—far from it. Among the private patients whom I see, nutritive deficiency is not infrequently the underlying cause of their disabilities. Lack of appetite, digestive disorders, and vague pains and discomforts unassociated with organic disease, constitute a fairly common symptom complex. This is seen particularly among women, young and old, irrespective of economic status, who would remain stylishly thin; among food faddists; and among those who because of some passing digestive disorder have been caught in a vicious circle of dietary restriction. This is usually called nervous indigestion, and often in lieu of a better diagnosis these patients are said to be neurasthenics. If the patients of whom I speak, however, can be encouraged to eat sufficient food of the right kind, then a semblance of nervous stability will return and their discomforts will disappear. It is not the psychotherapy that cures them. It is the food.

It is significant that this impairment of health which accompanies the suboptimal diet is not invariably as vague and as ill-defined as are the complaints of the group just described, for even such organic changes as atherosclerosis have been tentatively ascribed to an inadequate diet. King and Menten, on the basis of their above quoted animal studies on vitamin C, suggest that the production of hyperplastic arterial thickening in the guinea pig by a combination of vitamin C deficiency and infection, as seen by them, is not without significance in relation to the arteriosclerosis of man. From such evidence it would appear that to avoid arteriosclerosis a person should depend not upon a restricted diet, as is often advised, but rather upon a ration which is rich in minerals and vitamins.

The prevention of disease or its cure is not the sole benefit which accrues

from the more abundant diet. Of equal, perhaps even greater, importance is the enhancement in physique and with it the improvement of the race that comes with better food habits. Admittedly, heredity is a dominating factor in racial development, but environment, both internal and external, also plays a part. Every one here is familiar with the improvement in the racial stock of experimental animals which has been accomplished solely by suitable additions to an already satisfactory diet. An entirely new race of albino rats of greater vigor and vastly superior physique has been produced in the past twenty years through carefully designed improvements in the ration, and it is not unreasonable to hope that the same can be accomplished for man (16). Indeed, comparable changes, the result of man's improved environment, have already been the subject of comment. Attention has often been called to enhancement in physique seen in peoples who have been transplanted from a less favorable to a more auspicious environment, notably to the superiority in height, weight, and other characteristics seen in this country in the children of immigrant parents. Witness, too, the superiority in physical development over that of their forbears exhibited by the children born of Japanese parents living in California, and the greater stature of Chinese living under improved nutritive conditions in Hawaii as compared with that of identical racial strains remaining in the homeland. Examples could be multiplied.

To postpone definition of the title until the conclusion of an address is not, I know, good practice, but in closing I should like nonetheless to say what I mean by the word abundant. I am not thinking simply of the diet which produces greatest energy. Just the reverse. I am thinking rather of the diet which both in sickness and in health will meet but not exceed the person's caloric needs and which is designed to provide as far as possible, in liberal excess of today's calculated requirements, all nutritive essentials, notably proteins and vitamins. The difficulties are obvious. To construct such a diet while shunning the dangers of obesity and avoiding the irritating effects of too much roughage is not easy, but with an intimate knowledge of food values and with attention to detail it can be done.

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RECENT ADVANCES IN NUTRITIONAL RESEARCH[1]

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THE VITAMINS

A DEFICIENCY disease, of whatever nature, causes distinctive functional disturbances, which have their origin in morphologic changes in certain tissues which are regarded as primary effects. Various non-specific and secondary effects necessarily follow. The biochemist discovers the existence and the chemical nature of the vitamin and describes its effects on the animal. The pathologist makes his contribution in describing the morphologic changes in the tissues. The clinician is then in a position to interpret provisionally the etiology of the deficiency disease in the human patient, and to confirm his diagnosis by therapeutic trials of products shown by the experimenter to cause remission of the disease in his animals.

Vitamins A, D and E are soluble in fats and are associated with lipid extracts of natural products. Vitamins B_1, C (ascorbic acid), riboflavin and the antipellagra factor or factors, and certain others are soluble in water. There is at least one fat-soluble factor not listed above, and several water-soluble factors, known to be indispensable for the rat or the chick, which are not, apparently, essential for man.

Vitamin A. Vitamin A does not occur in the plant world, but its precursor, carotene, is widely distributed. It has been obtained from fish liver oils by distillation of a concentrate in high vacuum. It is a slightly yellow viscous oil. Its chemical nature was discovered through a knowledge of the molecular structure of carotene. Carotene is one of the yellow pigments found in yellow and green plants, and was so named because it was first isolated from carrots. It occurs in three forms, α, β, and γ-carotene. β-carotene has double the vitamin value of the other forms. Half a century of study by organic chemists of the degradation products, chemical reactions with specific reagents, and synthesis, of the class of compounds known as terpenes, of which turpentine and camphor are examples, prepared them for the immediate solution of the molecular architecture of carotene as soon as the biochemists had shown its importance as a precursor of vitamin A.

The striking pathologic condition of vitamin A deficiency is the result of accumulation of keratinized epithelial cells in glands and their ducts, and in many organs. Wolbach has discussed the subject in detail. In the lungs, cyst formation and bronchial occlusion, with consequent bronchiectasis and atelectasis, have been observed in man and animals. In organs, cysts are formed which are filled with a yellow cheesy mass of desquamated keratinized cells. Higgins (6), who has extended our knowledge of the production and solution of urinary calculi, which occur in at least 50 per cent of experimental animals deficient in vitamin A, points out that the sequence of events is keratinization of the epithelium of the genito-urinary tract, urinary infection,

[1] Read before the General Session, American Dietetic Association, Richmond, Virginia, October 19, 1937.

and alkalinuria due to ammonia formation. In experimental A-deficient rats he found in 42 per cent coexistent renal infection. The calculi form through precipitation of calcium phosphate from alkaline urine, probably facilitated by the presence of desquamated cells. On administration of vitamin A, the epithelial cells return to their normal form and function, the infection clears up, and the urine becomes acid. The maintenance of an acid urine causes gradual solution of the phosphatic calculi. O'Conor (15) has pointed out the frequent occurrence of calcium carbonate calculi in patients maintained on an alkaline diet in the treatment of ulcer, and states that the provision of abundant vitamin A is generally effective in preventing recurrence of these stones.

During the last few years several clinical investigations have been published on the skin lesions which, according to some observers, are the earliest evidence of vitamin A deficiency. Frazier and Hu (3) first pointed out that in this deficiency keratotic papules of varying size appear, distributed especially over the thighs, arms and shoulders, which arise from the pilosebaceous follicles. Microscopically, the ducts are distended, and the openings are plugged with desquamated cornified epithelium. Hyperplasia of the epidermis and atrophy of the glands characterize the skin. The eruption is said to be rare in children, but rather common in adults, and when fully developed probably represents late or severe deficiency. Youmans (23) has recently discussed the clinical aspects of this syndrome.

Particular interest now centers upon the effect of vitamin A deficiency in its relation to impairment of vision. Fridericia (4) first noted that in vitamin A deficiency the visual purple of the retina is not regenerated after it has been bleached by light.

Xerophthalmia and night-blindness are believed not to measure the incidence of milder grades of vitamin A deficiency. Jeans and Zentmire (9) have reported a series of 45 cases of mild hemeralopia in 213 children, and in later studies they found 26 to 75 per cent of children in different social groups with evidence of vitamin A deficiency. In general, their patients responded well to the administration of vitamin A. There is still some controversy concerning the adequacy of their technic for measuring dark adaptation of the eyes, and further studies will be awaited with interest.

Vitamin B_1. It is well known that severe deprivation of this vitamin causes beriberi, which constitutes one of the major health problems among rice eating peoples. At present there is no way to discover the extent to which sub-clinical deficiency, or clinical manifestations of deficiency more mild than are essential to cause beriberi, occur. Anorexia, weakness, vague pains, indigestion and hypotonicity of the bowel have been suggested as manifestations of deficiency of B_1, but the only criterion for this view is the favorable reaction of patients to yeast, or vitamin concentrate therapy. The complexity of the water-soluble vitamin group makes it impossible to decide whether B_1 or a multiple deficiency may be involved in these cases, although the presumption is strong that this is the specific factor involved.

Strauss (18) has recently reported

studies which show that dietary deficiency diseases, particularly pernicious anemia, and related macrocytic and idiopathic hypochromic anemias, pellagra, and "alcoholic," pregnancy, and other forms of polyneuritis in the temperate regions, are more frequently caused by conditioning gastro-intestinal disturbances which interfere with the digestion and absorption of nutrients than by inadequate composition of the diet. Persistent vomiting, diarrhea or dysentery may result in profound malnutrition, which responds to diet therapy.

The difficulty in determining the existence of moderate grades of B_1 deficiency lies in the lack of a specific and delicate method of determining this vitamin. Prebluda and McCollum (16) have recently announced the discovery of a test of great delicacy which, it is hoped, may make possible studies of the content of vitamin B_1 in biologic products comparable with those recently made on ascorbic acid.

Minot (14) has reported cases of diabetes associated with peripheral neuritis and achylia gastrica, which responded to yeast therapy, and raised the question whether achylia gastrica may not interfere with the utilization of both the anti-beriberi and anti-pellagra vitamins. Many cases are recorded of the appearance of avitaminosis B associated with voluntary restriction of the diet as a result of digestive disturbances, or restriction for therapeutic measures, as in diabetes.

Elsom (2) studied a patient who voluntarily restricted the diet, whose symptoms resembled those of pernicious anemia. There was marked pallor, glossitis, and signs of posteriolateral sclerosis. The typical signs of pernicious anemia, achlorhydria and anemia were lacking. There was edema and low blood proteins. Administration of a liver preparation adequate to produce remission of pernicious anemia caused only slight improvement of the glossitis. On administration of a concentrate of "B-complex" there was rapid improvement in respect to fatigue, anorexia, dyspepsia, paresthesis, edema, glossitis, scaling of the forearms and brittleness of the nails. Improvement began in two weeks and was complete in six. The pitting edema disappeared with simultaneous rise in blood protein, although there was no increase in the protein content of the diet. Elsom's case is interesting as a confirmation of the work of Strauss and because it suggests a cause for edema not found in the usual etiologies of cardiac and renal disease. In this case, doubtless, multiple deficiency existed, but there is reason to believe that the anorexia, dyspepsia, posteriolateral sclerosis and glossitis were caused by B_1 deficiency, the remaining symptoms probably arising from inadequate food intake and specific starvation for other water-soluble vitamins.

Cowgill (1) formulated a method for appraising the vitamin B requirement of the dog, rat, pigeon and man, which is based upon body weight, total metabolism (calories), and maximum normal weight for the species. He estimated the vitamin B content (the present B_1) of many human dietaries, correlated the results with health conditions and clinical observations, and concluded that vitamin B deficiency is widespread in regions where beriberi is rare, and to an extent which might be expected to

impair health. One may reasonably suspect that certain gastro-intestinal disorders, heart disorders, neurological conditions, marasmus, anemias, and perhaps hyperthyroidism may be caused by deficiency of one or more of the vitamins of the B-complex, or secondary manifestations of restricted intake or utilization of nutrients, secondary to such deficiency.

I have included these references to the clinical literature relating to so-called B-deficiency, because they suggest the importance of further study by clinicians of the previously obscure etiology of several disorders. The response to yeast administration or to concentrates which supply the same vitamins as does yeast, suggests the study of these conditions by the provision of crystalline B_1, which is now available in abundance and at low cost. There seems to be convincing evidence that B_1 deficiency is sufficiently common to be very important to the physician. By testing the value of the synthetic vitamin in several conditions in comparison with yeast, he can determine the significance of B_1 and of the remaining water-soluble vitamins as a health problem.

Riboflavin. Kuhn (12) discovered that the greenish yellow pigment of whey (lactoflavin) is an indispensable nutrient for the rat. Believing that he had isolated the anti-pellagra vitamin, he called it B_2 in accordance with the British nomenclature. Further study made it clear that this flavin does not prevent or cure the so-called rat pellagra, and that the substance had been misnamed. Lactoflavin has been synthesized. Flavins have been synthesized which have, respectively, each of several sugar groups replacing the d-ribose, but it is clear that the ribityl derivative is the one of biologic importance (10). Flavins closely resembling, if not identical with lactoflavin, have been isolated from liver, kidney, and egg white, and have been called, respectively, hepatoflavin, renaflavin and ovoflavin. From numerous nutrition studies with natural foods as the sole source of water-soluble vitamins, it seems evident that riboflavin is widely distributed in animal and plant products. We know nothing about the pathology of riboflavin deficiency, other than that rats cannot survive and grow without this factor. It has been shown not to benefit pellagrins.

Vitamin C. This substance is now generally called ascorbic acid, and in the pharmaceutical trade, cevitamic acid. It has been synthesized by several procedures, and is available in abundance at moderate cost.

The relation of ascorbic acid deficiency to scurvy is too well known to require discussion. Of greater interest to the clinician is the problem of subclinical scurvy with all its implications as a public health problem. Search for methods which will detect the earliest manifestations of ascorbic acid deficiency before clinical signs become evident have revealed that blood and urine analysis by chemical methods, and the determination of the resistance of the capillaries to pressure, may yield valuable criteria. Ascorbic acid may be determined by a titration method with very great precision. Adults, taking fairly satisfactory diets, carry 1.0 to 2.3 mgm. per 100 cc. of blood. Children subsisting on poor diets have shown values ranging from 0.687 to 0.917 mgm. Patients showing symptoms *compatible*

with mild ascorbic acid deficiency had 0.254 to 1.09 mgm. of ascorbic acid per 100 cc. of blood. Provision of a diet rich in the vitamin has raised the content in the blood to 4.31 mgm. The response of the blood content of ascorbic acid to administration is rapid, but falls off, with depletion of the body's reserves, within a few days when it is not provided by the diet. The minimum content of the vitamin in the blood compatible with health has not been finally established.

Yavorsky and King (22) found the tissues of human subjects to vary from over three times the "average" value to less than one-tenth of it. They estimate that 20 per cent of subjects examined *post mortem* (in America) were in a state of latent scurvy. The minimum daily amount of ascorbic acid intake which is required to prevent the slightest objectively ascertainable prescorbutic alterations has been estimated to be about 27–30 mgm. per day for the normal adult. Göthlin (6) believes, on the basis of studies on the capillary strength of children, that the child requires twice as much as the adult.

The test of capillary resistance is made by constricting the arm above the elbow, and counting the number of petechial points in one square inch of skin on the inner surface of the upper forearm. The results of different investigators on groups of children have shown considerable variation in individuals, and with the seasons. It seems certain that, notwithstanding marked individual differences in capillary strength due to causes other than the state of nutrition, there is a marked tendency to seasonal variation, the capillaries showing greatest strength during the season when fresh fruits and vegetables are available, and lowest strength in late winter and spring.

Studies on urinary excretion of ascorbic acid show that very little is excreted by the adult until the intake exceeds about forty mgm. per day. The excess over this amount is excreted by the kidneys. An interesting observation shows that active cases of tuberculosis require an intake of ascorbic acid much higher than do arrested cases to induce excretion of the vitamin. The arrested case behaves like the normal individual, whereas 50 to 80, or even a 200 mgm. intake is necessary in different individuals with active tuberculosis before an appreciable output in the urine is observed. There appear to be no data for fever patients other than those with active tuberculosis. It appears that in this disease, and perhaps in all fever patients, the requirements for ascorbic acid are very high.

King and Menten (11) have shown that guinea-pigs maintained on diets deficient in ascorbic acid, and injected with sublethal amounts of diphtheria toxin, showed diffuse hyperplastic arteriosclerosis in the lungs, liver, spleen and kidneys. Animals with high ascorbic acid reserves tolerate bacterial poisons much better than do depleted animals.

McConkey and Smith (13) fed tuberculous sputum to animals suffering from ascorbic acid deficiency and to animals on a normal diet. Ulcerative intestinal lesions of tuberculosis developed in the deficient animals but not in the controls. Reinhart, by combining chronic scurvy with superimposed infection, produced a picture which had striking similarities to rheumatic fever and rheumatoid

arthritis, and suggested that the subclinical state may constitute the "rheumatic tendency." The fact that administration of ascorbic acid to patients suffering from rheumatic fever has not proved effective as a therapeutic measure, in no way speaks against the view of Reinhart.

There seems to be very convincing evidence, therefore, that the maintenance of a high ascorbic acid reserve in the tissues affords not only a condition best suited for the maintenance of normal physiological processes, but likewise affords protection against pathological processes in certain tissues, occurring independently of disease-producing agencies, and also affords protection against tissue injury by bacterial poisons. These facts, together with the sensitivity of the odontoblastic membrane to deficiency of ascorbic acid which influences adversely the structure of the developing tooth, and in the mature tooth its nutrition, place nutrition, in relation to the prescorbutic condition, clearly among the more important aspects of preventive medicine.

Vitamin D. Vitamin D was discovered in its rôle as an antirachitic agent. The most striking effect of a deficiency of this nutrient is a fall in the content of inorganic phosphate ions in the blood. Such deficiency also exerts an extraordinary influence upon the behavior of the cartilage cells in the region of growth in the developing bone.

Vitamin D occurs abundantly in certain fish liver oils. Cod liver oil of U. S. P. grade contains 85 international units (I. U.) of vitamin D and 600 units of vitamin A per gram. The I. U. of vitamin D is an arbitrary one. Halibut liver oil contains 75 to 125 times as much D as cod liver oil; bluefin tuna liver oil contains 40,000 I. U. per gram; and percomorph liver oils greatly exceed this value. The chemical nature of vitamin D in fish liver oils has not been determined, but is probably similar to calciferol, which is crystalline vitamin D prepared from ergosterol by irradiation. Ergosterol is a sterol which occurs in relative abundance in fungi such as ergot and yeast. It is easily extractable by certain fat solvents and is obtained in crystalline form. When irradiated with ultra-violet light it passes through a series of transformations, the most important of which is the product calciferol, likewise crystalline.

The only method available for determining the vitamin D content of an oil is based upon observing the size of the dose necessary for the deposition of calcium salts in the region of growth in the bones of growing animals in the rachitic state. It has been found that if a sample of cod liver oil and one of calciferol are assayed with young rats and then with rachitic chicks, about 100 times as many rat units of calciferol as compared with rat units of the vitamin of cod liver oil are necessary to produce comparable calcification in the chick. This remarkable difference in the reaction of the rat and the bird affords a means of differentiating certain of the different forms of vitamin D. Rat unit for rat unit, the vitamin of bluefin tuna liver oil is only about one-seventh as potent for the chick as for the rat. Several careful investigations with human infants have demonstrated that the latter reacts almost equally well to the vitamin of cod liver oil and to calciferol.

Calciferol dissolved in some vegetable oil is known in the pharmaceutical trade as viosterol. The therapeutic dose of either of these forms of the vitamin is 1000–1500 I. U. per day. The usual prophylactic dose recommended is about 400 units. Cod liver oil contains about 100 I. U. per gram.

Studies of different derivatives of cholesterol and calciferol have shown the existence of at least six forms of vitamin D other than the two forms known to occur in nature in fish liver oils (*e.g.* cod liver and bluefin tuna liver oils). The potency of these different forms differs greatly. The two most important forms are the one in cod liver, halibut liver, percomorph liver and other oils, and calciferol.

Calciferol may be prepared from ergosterol by irradiation with ultra-violet light and also by subjecting the molecules of ergosterol to impingement by a stream of low velocity electrons. Both processes are protected by patent. The final products from these two methods of preparation are believed to be identical.

There is present in the skin a sterol of undetermined nature which, when acted upon by ultra-violet rays, either from sunlight or artificial sources, is converted into a form having antirachitic properties; hence sunlight containing such rays can prevent or cure rickets. In temperate regions, especially in cities where smoke screens cut the active rays of light, and where infants and children wear heavy clothing and remain indoors most of the time during the colder months, sunlight is not effective, and vitamin D should be provided during the winter months. Any of the fish liver oils sold for this purpose are satisfactory. A number of irradiated foods have been offered to the public as sources of the vitamin. Medical opinion now generally favors vitaminization of milk.

May Mellanby first demonstrated the importance of an adequate supply of vitamin D for the development of teeth with normal structure of enamel and dentine. She also showed by extensive studies on institutional children that the regular provision of vitamin D reduces the susceptibility of the teeth to decay. Several investigators have confirmed her findings. Since the normal behavior of cartilage and a normal content of phosphate in the body fluids are essential for the calcification of enamel and dentine, and both depend upon an adequate supply of vitamin D, the soundness of this view is apparent. The presence of pits and fissures in teeth, forming potential food traps, predisposes the teeth to caries. Since the ameloblasts are of epithelial origin, the significance of vitamin A, so necessary to prevent keratinization of this type of cell, is also apparent for the formation of normal enamel.

Richardson (17) reported a study of the effect of viosterol during pregnancy on the duration of labor in primipara which should be extended by other clinicians. Of 300 consecutive cases, 201 were given viosterol during pregnancy. The combined duration of labor of 132 primiparous patients who received viosterol totaled 792 hours, or an average of 6 hours per patient, which, he states, is one-third the length of the normal first labor. The combined duration of labor in 63 primiparous patients who were not given the vitamin totaled 1,197 hours, an individual average of

19 hours. There were 105 multiparous patients, some of whom received viosterol. He did not compare those given the vitamin with those not receiving it, but states that the average duration of labor for all the multiparous women was 3.5 hours, which is lower than the average time. He also states his belief that loss of blood at parturition was less in the viosterol treated women, which he attributed to increased coagulating power of the blood and more adequate clamping off of the vessels as a result of improved muscle tone.

Wilder and Howell (20) point out tnat the majority of human cases of parathyroid enlargement occur in the northern part of the United States, where there is a deficiency of sunshine. Several investigators have described extraordinary enlargement of the parathyroids in chickens deprived of vitamin D. This problem should be further investigated, as well as the possible relation of mastitis to vitamin D deficiency. This condition seems to be rare in the South, both in humans and in cows, whereas it occurs frequently in the northern states.

The Antipellagra Factor. There is unanimity among investigators that pellagra is due to some dietary deficiency, which has been called vitamin B_2, P-P factor, and vitamin G. For some years it was generally believed that a form of dermatitis in the rat caused by inadequate diet was the analogue of human pellagra. This is now known to be a mistaken view. Maize, which has generally been abundant in the diet of the human pellagrin, prevents or cures the rat dermatitis. The factor necessary for the prevention of the rat dermatosis is now called vitamin B_6. The nature of the substance or substances, a deficiency of which causes human pellagra, is entirely unknown. The administration of liver, yeast, or wheat germ is curative and often effects dramatic changes in the patient. Some studies with liver fractions seem to indicate that pellagra is due to double deficiency of unknown substances. The experimental status of our knowledge in this field does not warrant further discussion here.

Vitamin E. The most striking function of vitamin E is in the prevention of death and resorption of embryos in the rat, which invariably occur in its absence. The ordinary sex cycle in the rat is in no way disturbed when the vitamin is deficient in the tissues. In the male, prolonged deprivation of vitamin E results in sterility. Concentrates of the vitamin have been prepared from lipoid extracts, especially from wheat germs, which were effective in rat tests in doses of 0.1 mgm. daily. Lettuce is a good source of vitamin E which has not been obtained in pure form.

Vogt-Moller (19) has investigated the treatment of sterility and habitual abortion in human subjects by means of wheat germ or wheat germ oil. He controlled his experiments by applying treatment only to those cases where examination of the man and the woman showed apparently normal conditions. In treating 23 cases of habitual abortion, the birth of a living child was obtained in 17 instances. Further studies in this field are highly desirable.

Other Vitamins. The existence of more than 20 water-soluble vitamins has been suggested by as many investigators, but most of the experiments on

which such suggestions were made antedate the discovery of the importance of riboflavin and of the rat antidermatosis factor B_6. So far as one can determine from present knowledge, it appears that the human requirements for water-soluble vitamins are limited to B_1, C, riboflavin, and one or more antipellagra factors. The chick antidermatosis factor is demonstrated to be different from the rat antidermatosis factor, and it has not been determined whether the anti-blacktongue factor essential for normal nutrition in the dog corresponds with one of these rat or chick factors.

There is a disease of chicks described by Elvehjem in which crater-like ulcers in the lining of the gizzard are characteristic. Pork lung was found to be the most effective of several foods for the prevention or cure of this disease, but the active substance could not be readily extracted by any solvents used.

There is a so-called hemorrhagic disease of poultry, characterized by hemorrhage similar to those seen in scurvy, but ascorbic acid does not prevent the disease. Green feeds effect a prompt cure. The nature of the nutrient, a deficiency of which causes this disease, is unknown.

There is also a disease of poultry called nutritional encephalomalacia which has been described by several workers. It appears to be caused by deficiency of a fat-soluble substance, since Pappenheimer and Goetsch have effected a 20-fold concentration of it by making an alcohol-soluble fraction of soy bean oil.

THE MINERAL ELEMENTS

When one examines spectrographically the ash from the body of an animal it is found to contain small quantities of many inorganic elements. Those which have been reported present in animal and plant tissues should be distinguished in two groups: those which are known to play physiological rôles and are indispensable in the diet; and those whose significance to the organism have not been proved. The first group includes sodium, potassium, calcium, magnesium, chlorine, iodine, phosphorus, sulfur, iron, manganese, copper and zinc, and apparently cobalt. If any one of these elements is omitted from an otherwise adequate diet, failure of nutrition will supervene. Although our knowledge of the symptomatology of uncomplicated inorganic element deficiency diseases is still incomplete, it is clear that in such states the mode of failure of the animal is characteristic for each element. Inorganic deficiency syndromes are fully as dramatic, and fully as important from the standpoint of human health, as are certain of the vitamin deficiencies.

The second group of inorganic elements found in the body, whose importance is open to question, includes: aluminum, antimony, arsenic, barium, bismuth, boron, bromine, cesium, chromium, fluorine, germanium, gold, lead, lithium, mercury, nickel, rubidium, selenium, silicon, silver, strontium, tin, titanium, and vanadium. It is known that boron is essential for plant growth, and it may play a physiological rôle in animal nutrition, but the decision cannot be made on the basis of existing knowledge. Only three of this list of elements, boron, bromine and vanadium, are suspected of being important in animal physiology. Since it is almost impossible to prepare a diet adequate in all respects but free from one of these

elements, the experimental demonstration of their importance or unimportance, in a nutritional sense, is extremely difficult. That further studies in this field are important is supported by the fact that the necessity for normal nutrition, of copper, manganese, zinc and cobalt, has been experimentally demonstrated within ten years.

Most, if not all, of the chemical reactions associated with the life processes are the resultants of integrated chemical transformations. In these biochemical reactions the inorganic or mineral elements play fundamental rôles. The profound significance of the ions of sodium, potassium, calcium, magnesium and phosphate, with regard to the irritability of the nervous system, and to other physiological processes is well known.

Iron. Deficiency of iron is of widespread occurrence. Until recently it was believed that the total amount of iron in a food stuff represented available iron. It has been shown by Hill (34) that hematin iron is not available to the body. Elvehjem, Hart and Sherman (30) found that the iron of wheat, oats and yeast was available in nutrition to the extent of 47, 57 and 47 per cent, respectively. Even on the basis of an assumed iron requirement of 0.015 gm. per day for man, it was long ago appreciated that many dietaries containing a high quota of refined cereals did not provide enough of this element. The low availability of much of the iron of our common foods makes this element a special problem to the physician. Elvehjem and his co-workers, on the consideration of taste, toxicity, and so on, select ferric pyrophosphate as a compound of iron having many fine qualities. Its iron is easily available, but it is held in such firm combination that it does not produce astringent effects, so characteristic of other iron salts. Since it is soluble in neutral solutions it may be especially useful in cases of anemia with achlorhydria. It seems probable that some modification of prevailing methods of iron administration might well be considered.

Mention has been made of the integration of the chemical reactions in living tissues. An interesting study illustrating this fact in its relation to iron utilization has recently been described by Orten, Smith and Mendel (41). They restricted rats to a diet qualitatively complete, but supplying the essential inorganic elements at a low level. This extreme restriction of inorganic constituents of the diet produces significant alterations in the concentration of pigment and erythrocytes in the blood. There occurs a progressive increase in the number of erythrocytes per unit volume of blood and a simultaneous decrease in the concentration of hemoglobin. The diet was deficient in calcium and was somewhat lower in its content of iron than is believed essential for normal nutrition. It was less deficient in sodium, potassium, phosphorus, magnesium and chloride. They sought to discover the nature of the specific inorganic deficiency responsible for the polycythemia and concomitant anemia observed in the low-salt animals, since other animals fed the same basal ration supplemented with a complete salt mixture at an appropriate level were free from anemia. The addition of more sodium, potassium, magnesium or chloride, failed to improve

the blood picture in the anemic rats. Administration of additional iron resulted in improvement of the blood in some but not all animals. They observed, however, that the provision of more calcium for the anemic rats which were on the diet deficient in iron and other essential minerals, had a markedly beneficial effect. Under the conditions of the experiment, the provision of iron was not so consistently effective as calcium in correcting the polycythemia and concurrent anemia.

The widespread occurrence of anemia, the presence in foods of much iron not in the assimilable form, and the frequency of deficiency of calcium in the average dietary, may now be correlated in a very interesting way. The observations of Strauss (44) that vitamin deficiency syndromes are more likely to occur in persons who suffer from alcoholism, chronic vomiting, voluntary or therapeutic restriction of the diet, diarrhea or dysentery, because of conditioning of the digestive tract such that absorption of food substance is inadequate, also suggest the etiology and refractoriness of certain hypochromic anemias which do not well respond to iron therapy. The clinician may well study the effectiveness of combined calcium and iron therapy.

There is evidence that iron utilization is defective when the body's reserves of ascorbic acid are depleted. That anemia occurs in scurvy is well known, but it has been attributed by some to undernutrition and hemorrhage, though increased blood destruction has been suggested as an additional factor. Mettier and others (39) state that in adults with scurvy the pronounced anemia often encountered can be promptly relieved by providing fruit, green vegetables, and fresh liver, foods rich in vitamin C. There is reticulocytosis and rapid regeneration of blood. Neither large doses of iron nor the substance potent in pernicious anemia appear to accomplish these effects.

Dunlop and Scarborough (29) report the treatment of a man whose income was but $4.00 per week, and who subsisted on $1.50 per week for food. He had eaten bread, syrup, margarine, corned beef or smoked sausage, cheese and tea served with sugar and canned milk. In a year and a half he had taken no fresh vegetables, potatoes, fresh milk or fruit. He had symptoms of scurvy. His iron intake was estimated to be 10 mgm. daily, or about two-thirds of his requirement. He was kept on his usual diet and given 60 mgm. daily of ascorbic acid. Blood corpuscles increased during seventeen days from 2,050,000 to 4,226,000 and the hemoglobin from 45 to 77 per cent. After this he continued on his usual diet, but no more ascorbic acid was administered, yet in eleven weeks the corpuscles increased to 5,600,000, and the hemoglobin to 100 per cent. Pain ceased in two days after giving the ascorbic acid, and improvement of health continued for ten weeks after it was stopped. Dunlop and Scarborough conclude that vitamin C deficiency may be a factor producing anemia among working people even in the absence of scurvy.

The iron requirements of man have been estimated by several investigators. Daniels and Wright (28) believe that 0.6 mgm. of iron and 0.1 mgm. of copper per kgm. of body weight suffice for the

maintenance of normal growth of children of four to six years. Farrar and Goldhamer (31) conclude that 5 mgm. of assimilable iron daily is sufficient for normal adult males. Macy and Hunscher (38) suggest that 20 mgm. of assimilable iron daily are necessary for the pregnant woman.

Copper. After the demonstration of the necessity of copper for the utilization of iron in the body, several investigators have attempted to determine the daily requirements and the content of copper in various foods. The consensus is that the ratio of copper to iron should be about 1:5. Hawksley (33) has studied many cases of anemia in children to learn of their response to copper therapy. He cites the case of an infant with nutritional anemia in which iron therapy over a period of six weeks was ineffective. The addition of copper was followed by a rapid return to normal of the erythrocytes and hemoglobin. In his experience about one case in twenty of nutritional anemia in infancy suffers from copper deficiency, and all such cases show microcytosis.

The copper content of normal human blood varies from 0.185 to 0.229 mgm. per 100 ml., and is of the same order in other species. This element is fairly evenly divided between plasma and corpuscles. Hawksley states that the copper content of the blood in pernicious anemia, Banti's disease, acute myelogenous leukemia, chronic lymphatic anemia, malaria, nephritis, carcinoma, tuberculosis, and polycythemia vera, was normal or above normal in all cases studied analytically. It appears from fairly numerous food analyses that copper deficiency is not likely to occur in human nutrition, and that therapeutic administration of this element will be effective only in the exceptional case.

Manganese. That manganese is an essential element in nutrition was shown by Orent and McCollum (40) who employed a diet the ash of which was spectrographically free from this element.

On the manganese-free diet, young rats grow to maturity in an apparently normal manner. The females, as shown by the technic of Evans and Long, involving daily examination of vaginal smears, go through normal estrual cycles. They produce approximately the normal number of young if mated at proper intervals with normal males. These females, deprived of manganese, failed in 58 of 59 cases to suckle their young. They appeared indifferent and did not give them the opportunity to suckle which is characteristic of female rats on the same dietary formula with small amounts of manganese added.

These manganese-free females, when given foster young from our stock litters, failed in 8 cases out of 10 to suckle them, although the vigorous young were very aggressive because of hunger. The seven young reared by the other two females were retarded, apparently from insufficient milk supply.

Female rats of our breeding stock did not show interest and therefore did not give an opportunity for the young of manganese-free mothers to suckle. But 7 of 107 manganese-free young were reared by stock foster-mothers. These were undersized and of inferior appearance although the litters were small and in all likelihood secured all the milk they wanted.

Male rats raised on a manganese-free diet showed no abnormality other than testicular degeneration. This degeneration is well under way by the 100th day on the diet. The atrophy then rapidly progresses until only vestiges remain and complete sterility results. There is little or no obesity in these males.

The same manganese-free diet, after the addition of 0.005 to 0.05 per cent of manganese in the form of the chloride, kept males in sexual potency for at least 14 months. Their testes appeared normal at the end of the experiment.

Manganese is absent (spectrographic test) in the young of manganese-free mothers. It is present in new-born and 15-day-old rats of mothers on manganese-containing diets. Manganese therefore passes through the placenta if present in the mother's blood. It is also absent from the organs of rats raised on the experimental diet.

Manganese plays no rôle in blood regeneration.

Daniels and Everson (27) employed a milk-iron-copper-manganese diet on which they reared fifth generation young with approximately 100 per cent viability. The same diet without added manganese (*i.e.* cow's milk) contained 0.03 mgm. of manganese per liter. On the latter diet, 8 first generation females produced 103 young; 47 in first litters, 33 in second, and 23 in third. These young were sired by stock males, since male rats on a manganese-deficient diet become sterile within about 100 days. Of these 103 young, 41 either were born dead or died within two hours; 25 were anesthetized for analysis, and 37 were transferred to stock mothers. Sixty-nine per cent of these subsequently died within a few days; 12 were raised by two females (6 each) to weaning weights of 53.7 and 41.5 gm. respectively. In marked contrast to these results were the young of fifth generation females restricted to milk-iron-copper-manganese. Of these, 100 per cent were reared with an average weaning weight at 28 days of 69.2 gm., a weight corresponding to young of the breeding stock.

Mother rats on the manganese-deficient diet, which had lost their young at birth, were able to suckle 96.9 per cent of foster young from the stock colony, to average weaning weights of 58.7 gm. From these observations and those of Orent and McCollum, it is evident that fertility persists in female rats restricted to a diet so low in manganese that the young are not normally nourished *in utero*, and are debilitated at birth. The diet of Orent and McCollum was much lower in manganese than that of Daniels and Everson, which may account for the lower capacity of their rats to suckle stock young.

There appears to be no evidence that manganese deficiency occurs in man, though it is quite possible. Manganese deficiency, severe enough to cause serious malnutrition, is common in young chickens, as has been shown at the Cornell University Experiment Station.

In an investigation of the cause and prevention of so-called perosis, an anatomical deformity of the tibial metatarsal joint of young chickens, Wilgus and co-workers (45) found "that the common C.P. grade of calcium carbonate, hydroxide and chloride as well as of mono-, di- and tri-calcium phosphates and of monosodium phosphate aggravated the occurrence of this disorder to about the same extent as steamed bone meal.

"On the other hand, a technical grade

of mono-calcium phosphate actually possessed a preventive rather than a causative effect. A spectroscopic examination of this salt showed the presence of considerable manganese and traces of iron. A qualitative analysis indicated the presence of aluminum as well. The subsequent addition of an equivalent amount of manganese, 0.0025 per cent, to a basal diet containing 0.0010 per cent, demonstrated that this element was responsible for the preventive action of this salt. This amount of manganese was found to be quite effective in preventing perosis at levels of 1.0 and 1.2 per cent of calcium and at levels of 0.8 and 1.2 per cent of phosphorus. The addition of a mixture containing 0.0025 per cent each of manganese, aluminum and iron was entirely preventive at the lower calcium and phosphorus levels and had a slight beneficial effect of growth. Further results showed that aluminum and zinc had a similar but less effective preventive action. The perosis preventing property of common feed stuffs was roughly in proportion to their manganese content.

"It is concluded that perosis is due to the lack of certain inorganic elements, of which manganese is notable, and that its occurrence is aggravated by an excess of calcium and probably of phosphorus."

Cobalt in Nutrition. Bertrand and Macheboeuf (25) determined the quantity of cobalt in various human tissues. Expressed as milligrams per kilogram of fresh tissue, the cobalt content was: Fat less than 0.010, muscle 0.025, stomach 0.030, brain 0.040, uterus 0.080, liver 0.250, kidney 0.250, pancreas 0.350, spleen 0.470. Cow's milk contained 0.015 mgm. of cobalt per kgm. Bertrand (24) noted the presence of considerable amounts of cobalt in insulin preparations. Simultaneous injection of small quantities of cobalt and insulin into rabbits or dogs markedly increased the action of insulin on the blood sugar.

Orten and co-workers (42) in 1932 showed that administration of cobalt to rats restricted to a milk-iron-copper diet, caused marked polycythemia. This observation has been confirmed by others. Lines (36) reports that a condition in sheep, known as "Coast disease" in South Australia, characterized by anemia, loss of weight and appetite, is relieved by the administration of minute amounts of cobalt nitrate. Stare and Elvehjem (43) have reared rats on a milk-iron-copper and manganese diet and found that the entire body contained less than 0.01 mgm. of cobalt. They state that the presence of 0.04 to 0.05 mgm. of cobalt in the entire body of a rat was sufficient to produce marked polycythemia. Such evidence as we possess seems to indicate that cobalt is an essential element, and that extremely small amounts of it suffice for normal nutrition. The evidence is conflicting. Fisher and Scott (32) were unable to detect cobalt in the pancreas of cattle of any age, and Blumberg and Rask (26) could not detect cobalt in milk by the spectrograph.

Iodine in Nutrition. The continuing interest of investigators in the rôle of iodine in relation to health is indicated by the fact that in the years 1931 to 1936, inclusive, 387 titles are abstracted in a journal under this element as the key word. These contributions, while affording much interesting and useful information, contribute little that is

novel as to viewpoint. A study by Lang (35) is of particular interest. He states that goiter did not develop in rats kept in the laboratory on soils from goitrous regions. When the soil was ordinary peat, goiter of the hyperthyroid type appeared in which the goiterogenic factor is suggested to be female sex hormone, of which there were 500 mouse units per kgm. of fresh peat.

McCarrison (37) found that diets with a deficiency of several vitamins were more goiterogenic than those which lacked only one, but dietetic factors alone were not sufficient to account for the occurrence of goiter in experimental animals. Lymph adenoid goiter was produced in rats on a vitamin deficient diet even though there was an adequate ingestion of iodine, but was not observed when the diet was supplemented with yeast or cod liver oil. Goiter due to calcium excess was prevented by increasing the iodine content in proportion to the calcium excess. Surveys, he states, did not show that goiter was due entirely to an iodine deficiency. He believes that iodine deficiency is favorable to certain types of goiter, but not essential to any type. The goiterogenic action of cabbage and other *Crucifera* is connected with the presence of cyanogen compounds, as was shown by Chesney. There are no important new researches on the significance of such foods in the etiology of goiter. It has been demonstrated, however, that if the reserves of ascorbic acid in the body are kept high a protective action is effected on the thyroid gland.

Magnesium. My associates and I have given considerable attention, during recent years, to the study of the effects of magnesium deficiency in the rat and dog. We were able to reduce the content of magnesium in an otherwise adequate diet, to 1.8 parts per million. On this diet young rats respond within 12 to 15 days with a reduction of the magnesium content of the blood from the normal of about 2.5 mgm. per 100 cc., to less than half this value. This diminished magnesium in the blood brings about a striking chain of symptoms-vasodilation, acceleration of the heart-beat, and convulsions, ending in death. The only change in the composition of the blood other than magnesium, which we have been able to detect, is marked increase in the cholesterol ester level. The blood calcium remains normal. The animals are hyperirritable, and respond to much smaller electrical stimuli than do normal ones. This syndrome necessitates the expansion of the term tetany to cover what we have termed "low magnesium tetany." A few clinical investigators have reported low values for magnesium in human subjects suffering from hyperirritability. This field should invite further exploration.

I have mentioned calcium and phosphorus metabolism only incidentally. This is because there have been no really fundamental researches in this field during the past few years. The action of the hormone of the parathyroid glands as a regulator of calcium in the blood, and the relation of vitamin D to the phosphate content of the blood and to calcification of the osseous system, are well established; the more fundamental researches, *i.e.*, those which reveal how these substances accomplish these effects, remain to be made.

While it has been shown by the

Wisconsin group that zinc is an essential element for normal nutrition, nothing is known about the rôle of this element in physiologic processes, nor the pathological effects of its deficiency.

Thus far I have discussed only those mineral elements which play physiological rôles—the indispensable ones in the diet. There are two mineral elements which have come into prominence during recent years: fluorine and selenium, which are widely distributed and constitute health hazards. There are more than 100 localities in the United States where the drinking water contains more than two parts of fluorine per million. Some waters used for drinking contain considerably more than this. Such waters cause mottling of the teeth of children.

Selenium is known to occur in the soils of South Dakota, Wyoming, Nebraska and Kansas, in amounts which create a serious problem in the rearing of farm animals fed solely on home-grown produce, and may constitute a human health problem. Wheat grown on a soil containing two parts per million of selenium, contains, in the grain, as much as twenty-five parts per million. Smith and co-workers have recently reported a study of 111 families in South Dakota, which strongly suggests that this element is taken by many in quantities detrimental to health. The discussion of these non-essential elements would be beyond the limits of this paper.

In summary, we now know that animals may fail nutritionally because of dietary deficiency in any one of nine to fourteen amino acids (five have not been thoroughly studied), as demonstrated by W. C. Rose of the University of Illinois and others; and that a deficiency of any one of at least twelve inorganic elements essential in nutrition, as well as a vitamin deficiency, may likewise cause nutritional failure. These many advances in our knowledge of the components of the normal diet have been made within forty years. Investigators are now in a most favorable position to extend their discoveries more rapidly than at any time in the past. We may look forward confidently to a complete solution of the problem concerning the nutritive requirements of different species of animals and man within a few years.

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THE VALUE OF STANDARDS[1]

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A POET has stated that the proper study of mankind is man, and one may say that the proper study of life is represented in an appraisal of dietetics. Primitive man had his dietary problem and his struggle for existence was largely based upon being able to obtain adequate supplies of protein food, aided probably by some grasses and berries. It was impossible for any great advance in population or for any cultural or civilizing progress until primitive man was able to develop the early beginnings of agriculture. With the domestication of animals and the development of agriculture, fixed habitation became possible and cultural development followed. It was but a short step from this evolutionary period for the priest-physician to utilize articles of diet primarily for therapeutic purposes and history records the almost illimitable pharmacopeia which consisted of every conceivable commodity obtainable.

Galen wrote extensively of diet, and in a rough and empiric way certain diets were established for various diseased conditions. One can today visualize the thermal spas of Aesculapius at Epidaurus and vestiges are not wanting of the importance of diet in the medical regimen of that time.

It is rather interesting that the words diet and dietetic are derived from the Greek, with the Latin mutation, *dieta*, and meaning a "mode of life." It is also not without significance that the word diet connotes food and the regulation of feeding, as well as an assembly or council; the latter meaning probably arose from the fact that the deliberations in the medieval commune always followed a feast.

It has been stated that the average person throughout normal life consumes fifty tons of food and under ordinary circumstances there is neither a gain nor loss of weight except that incident to growth. Various theories were devised, such as the phlogiston and the humoral, to account for the utilization of food material. Food, water and wine have occupied a preëminent place in the thought of all people throughout history. In fact it has been predicated that the personality of man was determined by what he ate. Brillat Savarin cynically asserted "Tell me what you eat, and I will tell you what you are", and one's longevity has been ascribed rightly in many cases to the restraint and temperance with which one ingests food. The French express this philosophy in the axiom "*la morte entre par la bouche*", which translated into the more tonal qualities of everyday life would mean that many people eat themselves into an early grave.

It is not surprising that the scientific aspects of this thing we call eating should have engaged the minds of the scientifically curious. In 1592 Galileo became professor of mathematics in the University of Padua and there met a whimsical and courteous individual

[1] Read before the New York State Dietetic Association, Hotel Astor, New York, May 20, 1937.

with the euphonious name of Sanctorio Sanctorio, now known to history as Sanctorius. He was the professor of medicine at the University of Padua and devised the first clinical thermometer, measured the pulse rate, measured the heat of the body and measured the body weight under varying conditions. Modern nutrition was founded by Sanctorius with his inception of invisible perspiration. He may be stated to have been the forerunner of our laboratory and chemico-physiologic studies in water and chemical balance. A few of his aphorisms are worthy of quotation:

"If eight pounds of meat and drink are taken in a day the quantity that usually goes off by insensible perspiration in that time is five pounds.

"If a physician who has the care of another's health is acquainted only with the sensible supplies and evacuations and knows nothing of the waste that is made daily by the insensible perspirations, he will only deceive his patient, and never cure him."

The modern era of the science of nutrition, however, was initiated by Lavoisier, the father of modern chemistry, whose working inspiration was that life is one chemical function. The drama of Lavoisier's life is not without its present day application and indicates the continuity of scientific endeavor for social usefulness. As a portion of his activities, he became interested in soil production and thereby incurred the enmity of the revolutionary party of the French Revolution and was executed on May 8, 1794. Contemporaneous with him was Lagrange, noted mathematician, who made the poignant comment: "It took but a second to cut off his head; a hundred years will not suffice to produce another one like it." Another contemporary of Lavoisier was Bertholot who was the instructor in chemistry to Napoleon I, and who gave his sword to Gay-Lussac. The latter was instrumental in bringing Liebig to Paris where he resided in 1822; and from the teaching of Liebig came the revelatory contributions of Voit and one of America's great students of nutrition, Graham Lusk, who was an inspired pupil of Voit. Magendi, with his encyclopedic mind, was later able to differentiate the various forms of protein, carbohydrates and fats and to formulate the idea of metabolism as having two phases, catabolism and anabolism.

The application of the universal law of physics known as the conservation of energy, that nothing is ever created or destroyed, was also in the background of any intellectual excursions into dietetics and the scientific mind was groping for precision in the application of dietary standards.

In the 14th and 15th centuries Vasco de Gama, Cooke, Drake, Hawkins and other explorers were well acquainted with the terrible malady of scurvy, and Dr. James Lind in 1747 began the first controlled experiment in dietetics using as subjects twelve men sick with scurvy. Some had added vinegar in their diet; others, a quart of cider; and one group, oranges and lemons. Only those receiving the last-mentioned addition were prevented from developing scurvy. This experiment represented qualitative scientific information and lacked the accuracy of measurement or absolute quality of mensuration essential for quantitative determinations. In a social sense this experiment of Lind was not

without its significance for it was not until 1795 that his suggestion was followed and it was not until 1854 that a law was passed making it mandatory for rations of lime juice to be served to sailors. As a result, seafaring Englishmen became known as "limys"; and the warehouses where the limes were stored in London, as the limehouse district celebrated by Thomas Burke in his stories "Limehouse Nights".

For nearly 2000 years the disease beriberi has been in existence and in the Russo-Japanese War one of the greatest dietary experiments ever observed was taking place. The Russians incarcerated in Mukden were dying of scurvy while the Japanese Army outside was afflicted with beriberi. An exchange of the diet of the respective armies might have abolished both diseases.

Rickets has existed since time immemorial; pellagra has had a long history in certain areas of the United States; and pernicious anemia certainly has existed throughout all the history of mankind. It was apparent to many men that these diseases and many others were related to diet and certain qualitative experiments have been carried out. However, it was only within the last fifty years that qualitative methods in dietetics became supplanted by quantitative methods. With the development of respiration experimentation on animals it was possible to measure food variations in precise terms; and with the development of animal control, food variations were defined and measured in precise terms by means of animal reactions. Thus the field of nutrition was able to adopt standards that were as valuable as Koch's postulates in bacteriology.

It has been stated that 37 chemicals must be present in a complete diet and it would follow *a priori* that it is possible to have 37 deficiency diseases. What a startling thing it is that the maternal instinct in experimental animals is inhibited if manganese is omitted from the dietary.

The story of researches in vitamins, with the determination of the growth-promoting agent, is one of the most romantic chapters in the whole field of medicine. The vitamin associated with tissue resistance brings the whole field of immunization in its broadest sense within the field of dietetics. We know that under proper standards of diet a race of people are being produced that are taller and stronger; that babies are being better born, with more graceful symmetry and more inherent beauty; and that the quality of life is being improved and the average length of life is being increased.

Dietetics is a science that aids and supports the art of medicine. It employs all contributions that are useful and honest, irrespective of their source—medical or lay. Two questions confront your Association: first, the qualifications of dietitians; and second, the ethics of your profession. Both these questions have more than a passing interest to the medical profession. Essentially the profession and science of dietetics are ancillary to medical practice. More and more frequently diet is occupying an increasingly prominent position, both in actual therapy and in the prevention of disease. While your art is young, scientifically speaking, it has behind it an agelong history and a splendid tradition. Science exhibits a progressive growth, and with a progres-

sive development in all other human activities certain standards of knowledge, effectiveness, and competency are evolved. The chief implements for the development of standards are organization and the generally prevailing scientific knowledge of the subject. As a foundation for the implementation of these, there are required character, intelligence, prescribed courses of study, apprenticeship and institutional responsibility. For the accomplishment of any desirable social objective there is required a long period of public education. It is almost impossible to obtain high standards for anything until a public sensitivity for improvement of the *status quo* has been obtained by continuous enlightenment of those most interested in the matter.

What is good for society in the long run will benefit you individually and collectively. It is apparent that the standards and competency of those individuals seeking recognition as dietitians should reach higher levels; certain commercial institutions may for a time seem to impair or delay this highly desirable objective. These institutions, however, will not survive. By means of your organization and others of similar purpose the general level of nutritional studies will be raised; and the preliminary educational requirements made more exacting, the courses of special studies made longer and better, so that the time is not far distant when your profession will feel that all of your efforts have been socially useful even if all are not immediately successful. Your place in the hospital and in medical practice is becoming more important and of greater service to the sick. In a larger sense it will become more important to the community as a whole as the food faddist and nutritional fakirs disappear. The medical profession are happy to extend their felicitations and support and to wish you success in your efforts.

THE HUMAN SIDE OF OUR WORK[1]

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OLIVER WENDELL HOLMES once said, "The great thing in this world is not so much where we stand, as in what direction we are moving." As a professional organization, I believe that the American Dietetic Association in the twenty years of its existence has made a splendid record of progress. We have been favored by the rapid development in many related fields of activity as well as our own, so that we have been able to travel, as it were, by airplane or at least by fast train. We are sure that we are moving, but perhaps it is well, once in a while, to stop long enough to inquire whether we are traveling in the right direction.

Having established standards of preparation and training for our profession, we have not been content to rest on past accomplishments. We have actively participated in studies through national, state and local groups and have, I believe, accomplished much in the development of the technic of our profession. In common parlance, we know our diets.

Recently, however, we have had our attention directed to a diet which I fear is less familiar to us than it should be, and therefore one to which we should give more study and consideration—the diet of Psyche (1). Judging by the present state of mental unrest, Psyche may even need a "special" or therapeutic diet. In other words, do we not need to give more thought and study to the mental reactions between ourselves and those with whom we are associated? A perfected technic is essential, but to achieve success in our work we must also develop harmonious human relationships. We are part of a complicated social organization—an atom in the molecule of humanity, or shall we say, a proton or neutron which bombards the human atom?

The hospital represents a small segment of this vast social organization. Within it there are three groups with varying levels of responsibility: (1) the administrative, who develop objectives and policies and provide for their maintenance; (2) the executive, comprising those responsible for executing these policies and seeing that the objectives as set forth are attained; and (3) the personnel, or those who perform the work necessary to accomplish the desired objectives. The primary objective of all hospitals is the care of the sick. A secondary one may be research, and a third, the education of workers to care for the sick.

It is evident that the work of the dietary department in the feeding of the sick and the well is a part of the general objective of the hospital, and that the dietitian entrusted with this responsibility is an executive officer. She must plan for every detail of the work—the preparation, distribution and serving of the food. She must carry out orders from the director or his assistants, as well as from the medical staff, and must coördinate her work with that of the

[1] Read before the Missouri Dietetic Association, Kansas City, Missouri, May 14, 1937.

nursing department, especially if the serving of the patients' food is under the direction of the nurses. Indeed, since she feeds the staff and personnel, as well as the patients, she is in close association with every department. Because she takes orders and in turn gives orders, in the hospital organization she functions like a brain cell of the body which receives an impulse and transforms it into an action.

There is probably no more important function of an executive than the management of the personnel assigned to his direction. This may be accomplished by two methods: by command, if backed by sufficient authority to enforce orders; and by leadership. Napoleon, whose ruthless exploitation of human beings finally brought about his downfall, was an example of the commander or driver. Some military men have been leaders as well as commanders. But the most effective executive is he who attains leadership which Tead (2) defines as "the activity of influencing people to cooperate toward some goal which they come to find desirable." In other words, leadership is the ability to influence people.

Many people are of the opinion that executives are born, not made. Undoubtedly, some people are so fortunate as to have been endowed with unusual executive ability, but it is equally true that even the "natural" executive is benefited by training, while the less fortunate individual who has merely a determination to succeed in this capacity may hope, with at least a reasonable degree of success, to acquire the necessary personal qualifications.

Some of the characteristics necessary for leadership are:

1. Interest in, and affection for people. Schell (3) says that such executives are "moulders of human stuff. . . . Their problem is that of human relationships which are ever-complex, ever-changing, ever-defying standardization. Success in handling men requires an abiding interest and continuous thought."

2. Judgment. Gow (4) says that of all the qualities which can be hired in the market place, sound judgment is the scarcest. He defines judgment as "A knowledge of the general laws of nature and of human nature, combined with power to apply them to specific cases in order that a correct mode of conduct may be decided upon in advance of an event."

3. A sense of justice. The disposition to give a square deal and to weigh all evidence before rendering a decision is absolutely essential to good management. The treatment of employees without partiality or favoritism is fundamental in the handling of men. This quality does not, however, prevent the handling of all employees with kindness and respect.

4. Courage to meet and overcome difficulties. The executive must have the courage to see that orders are carried out, even though it requires much effort and patience to overcome the inertia of fixed habits on the part of employees.

5. Cheerfulness and a sense of humor. The ability to smile and to see the lighter side of difficult situations often relieves a high state of emotionalism on the part of employees or others. Tact is the ability to understand the emotional background and to say the right thing at the right moment. It is an outgrowth of one's ability to understand human nature.

6. The acquired characteristics of calmness, firmness, patience, kindliness of thought, and courtesy. Indeed, an executive must always exercise self-control; he must be master of himself before he is fitted to be master of others.

7. Last, but not least, the ability to

teach. This ability may be native or acquired. The teaching of the employee is quite as important and is attained by much the same methods and principles as the teaching of students in the laboratory.

Personnel management begins with the selection of the new employee. While you are interviewing him, he is also "sizing up" the interviewer. The impression he gets of you will influence his loyalty and cooperation. It is important, therefore, that the interview should proceed in a dignified, attentive and courteous manner. In order to get certain required information, we have found an application card helpful. You at once learn whether or not the applicant can read and write. While questions must be asked, information should also be given. The applicant should be told and, if possible, shown just what and where his work will be, and where he will be housed. A written work schedule or a job analysis is the best way to define the duties and the hours.

To ascertain the character of the individual and his experience, many organizations require references. Some one has said that even though an individual had a prison record, it would still be possible to write a good letter of recommendation for him, without falsification. It is self-evident that no applicant would present a letter of recommendation which was not altogether satisfactory to himself. While it is regrettable, it is also true, that many employers are not altogether just to other employers in giving a recommendation that may fail to mention serious defects of character. Many employers have learned, moreover, that workers react so keenly to their environment, conditions of labor and type of work, that a recommendation of past performance, especially behavior, is weighed lightly.

While there is no doubt that a careful observer can read much of the characteristics of an individual by the facial expression, the pose, voice, and manner of speech, it should be remembered also that impressions thus made are only impressions and should not be relied upon as the sole determining factor in character analysis. One of the most important considerations in the selection of an employee is his fitness for the job. Jobs have been standardized while the human element is variable; therefore the employee must be selected to meet the special requirements of the job.

It is important that the man should be fitted to the job, but the emphasis has shifted greatly. "Some modern writers go so far as to say they do not believe that it makes much difference what sort of job a man gets, within wide limits; they believe that if he is interested in the job and likes to do it, or if other strong incentives exist, he will develop unexpected ability or abilities which will enable him to meet successfully the demands of the new job." (5) In other words, emphasis is now placed upon the training of the employee quite as much as upon the selection.

Having engaged the new employee, the next step is to introduce him to the organization and his fellow workers, and to train him for his job. The time required for this will depend upon his previous experience, his ability and his interest. Time spent in teaching the new employee is therefore usually well spent. The work should be taught in its elemental parts and a standard method applied to each element. Cor-

rectness of method should precede speed in operation, and patience must be exercised if the new employee shows any promise of attainment.

Having succeeded in training the employee, the next problem is how to maintain his interest in the standards already established. One of the best ways that I have found is for the supervisor to show an interest also. This is done by taking note of work well done. The weekly inspection, instituted long ago in army hospitals, is still an effective method of keeping the work up to par. If this is made an occasion for talking to the individual worker, pointing out weaknesses and praising him for work well done, he will usually endeavour to improve.

My experience leads me to believe that the average man or woman will try to live up to what is expected of him. Employees' conferences constitute an excellent way of building up the morale of the personnel. They should not only be talked to, but should be asked for their opinions and suggestions as well. We are told that Judge Gary, in the earlier days of the steel industry, was desirous of securing the wholehearted cooperation of his entire executive staff, so he called a conference which lasted several hours. During the rather heated discussion, each man had opportunity to express his opinion. At the end, Judge Gary arose to review the discussion and by asking a few pertinent questions, finally succeeded in getting the group to agree, and the Judge's original plan went forth with their support just as he had anticipated. People, whatever their station in life, like to be consulted.

Interest in the welfare of employees is also well rewarded. Wages are an important consideration, but other things may mean quite as much. Interest in the individual and his problems, his advancement, opportunities for recreation and entertainment, a comfortable room, attractive and satisfying meals, all contribute to make the satisfied worker. Our concern for the welfare of an employee should be real, even to encouraging him to aspire to higher positions than we can offer if we feel he is worthy of them. Often a dissatisfied worker needs just that encouragement.

Sometimes disciplinary measures are necessary. If the employee's work is unsatisfactory, take him aside and talk to him in a quiet but earnest manner. Never discipline an employee before others, for this lowers his self-respect and creates resentment and disloyalty. If possible, find something worthy of praise in the individual and speak of this before making criticism. Make him feel that you believe his intentions are good, that his failure to comply must have been a misunderstanding. As long as he remains in your employ, let him feel that you have faith in him.

In spite of all efforts to manage wisely and fairly, and to stimulate good service, it sometimes happens that an employee fails to meet any reasonable standard of work. Altercations and disturbances arise, making disciplinary measures imperative. In such event discharge may be necessary, but this should be effected quietly and promptly. The difficult employee should be a challenge to the managerial ability of the executive. If cooperation cannot be secured, what is wrong with the executive's management and under-

standing of human nature? Formerly the spotlight was always turned on the employee. Now we find that quite frequently it should be turned on the executive.

In addition to relationships with employees, the executive also has other responsibilities. Harmonious interdepartmental relationships are the aim and the expectation of the administration. An executive who does not work harmoniously with others is lacking in an important qualification which may outweigh all other competent services. Unless executives feel free to discuss problems with each other, something is wrong. The wise person will make every effort to ignore personal slights and petty grievances, and to maintain cordial relationships.

As head of her department, the dietitian must meet at the conference table with other executives where each must give and take. It is always easy to give but can she take as well? If she remembers the Statler motto "The guest is always right", it will smooth over many a difficult situation. She may find it advantageous to invite a committee, representing at least two or three of the larger groups, to meet with her once a week to go over the menus in advance, in this way making the group feel they share the responsibility. A few conferences of this type, if the right spirit prevails, will usually suffice to give a better understanding of all the problems involved. When the writer first came to her present position, she was given seven typewritten pages of suggestions—four were "Things We Don't Like" and three, "Things We Do Like". Shortly afterwards, the author of the lists was invited to become a member of a menu committee. It was interesting to note the rapid change in his attitude.

Can we get our ideas over to other conferees? If not, why not? There may be several answers to this question. Perhaps we have not thought the problem through, or perhaps we have failed to base our premises on facts.

In answer, therefore, to our question "Are we traveling in the right direction?", may I say that I believe we are, but I also believe that we should veer strongly toward the human side of our work, both in our study and in our practice. I hope the time will come when our colleges will lay more stress upon what might be termed "the science of getting along with people". There may be troublous times ahead. The hospital field as well as industry is being invaded by forces intended to undermine authority and executive control. Let us look, therefore, to our own management, that it shall neither give offense nor fail to direct and coördinate. Let us not forget that our strength lies in our leadership.

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A PECTIN-AGAR PREPARATION IN TREATMENT OF INFANTILE DIARRHEA[1]

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THE use of raw apple in the treatment of diarrhea in children seems to have originated in the folk medicine of the Mid-European peasantry, and while at first glance it may appear paradoxical to treat diarrheal disturbances with fruit, reassuring evidence in support of the treatment is accumulating in the literature.

It is interesting, if not significant, that of all fruits, apple is mentioned most frequently in folklore. In accounts of German folk customs we find references to the use of the apple in specific ailments (1). In Pomerania, eating an apple on Easter morning is believed to be a prophylactic for fever; while in Hessen, an abscess will follow the eating of an apple on New Year's Day. In Silesia, an apple is scraped from the blossom end to cure constipation, and from the stem to cure diarrhea. This custom of using scraped apple in cases of diarrhea led Heisler, about 25 years ago, to determine the value of the apple in the treatment of infantile diarrhea. This idea was popularized by Moro and presented in 1930 by Heisler at the International Congress for Pediatrics in Stockholm.

In reviewing the literature on the use of fruit diets in intestinal disorders, we find that since the publication of Heisler's 1928 report there have been more than 200 papers on the subject in various foreign and American journals. The first in an American publication was that of Birnberg's (2) in 1933, in which he described his experiences with a large number of cases of diarrhea treated with raw apple. Since then, Reglien (3), Kaliski (4), Giblin (5), Rowley (6), McCaslan (7), Tompkins (8, 9), Borovsky (10), Manville (11), Stein (12), and Hunt (13) have described their satisfactory results with this mode of therapy. Smith (14) gives a negative report which he concludes: "In both mild and severe types of diarrhea in infants the results obtained with apple therapy were no better than those obtained in any other type of treatment. Any beneficial results obtained from the use of the apple diet were due to the period of starvation and the rest induced in the gastrointestinal tract by the bland nonirritating qualities of the apple."

A number of reasons have been given for the benefits derived from the apple diet. These curative factors may be divided into five groups: acids (malic, tannic, etc.); sugars and starches; cellulose and hemicellulose; vitamins; and pectin. Several of these have been shown by experimental work to be worthy of only brief consideration (15).

Sugar and starch, of course, have caloric value and probably act to increase the colloidal properties of the pectin.

[1] Read before the Diet Therapy Conference of the American Dietetic Association, Richmond, Virginia, October 19, 1937. The report is taken from a study done with Dr. C. A. Tompkins under the supervision of Dr. M. Winters, and made possible by a grant from Mead Johnston and Company.

The vitamins and minerals of the fruit diet have their important nutritional values but their concentration in the fruit does not seem to be high enough to account for the total therapeutic action of this type of diet.

Neutralizing the acid of the apple does not decrease the curative potency. The non-acid banana gives results equal to those obtained by the use of the apple. Juices of carrots and certain weeds which contain much pectin but very little cellulose and free acid, are effective. The tannin content of the apple is very low and it has been shown that commercial tannin preparations are of little or no value.

Moro feels that one of the chief values of cellulose lies in its ability to provide bulk (16). Heisler advises the use of unpeeled apples believing that it enhances their value (17). Scheer used an agar milk preparation in the treatment of diarrhea with excellent results (18). Malyoth, however, attributes very little importance to cellulose. He fed strained currants which are rich in pectin and cellulose-free, and obtained results indicating that cellulose is not essential in treatment (19).

Pectin is the only component in the apple which, if inactive, renders the treatment ineffective. Apple treated with the enzyme which inactivates the pectin has been found to be ineffective. Apples low in pectin are not so effective as those high in pectin. Pectin preparations, *per se*, give results equal to those obtained with the apple diet (20).

The chief value of apple in treatment of diarrhea and dysenteries seems to lie in its pectin component. Pectin is a complex carbohydrate having the formula $C_{70}H_{98}O_{58}$ with a molecular weight of 1866.784. The molecule is made up of 8 molecules of galacturonic acid, one of arabinose, one of galactose, two acetyl groups and seven methoxyl groups (21). The physical properties may be summed up as follows:

1. It possesses absorptive capacity for bacteria and toxins (19, 22).
2. Because of its colloidal nature, it is capable of taking up large quantities of fluids; this provides bulk which helps to sweep out harmful materials in the intestines and offers a normal stimulus to peristaltic activity.
3. By its buffer action it helps to maintain a constant reaction in the intestines.
4. It acts as a protective colloid on an inflamed and perhaps ulcerated intestinal mucosa.
5. Hemostatic action (23).
6. Bactericidal action, *in vitro* (24).

Pectins are hydrophilic colloids possessing high absorptive ability. It is partly due to this quality that pectin is able to fix bacteria and toxins and thus render them inert. Due to the same property, pectin is able to take up the fluid secretions and thereby convert a fluid stool into a formed one. It is believed that the excessive peristaltic activity of the intestine during diarrhea is due to the presence of irritants. Pectin probably inactivates the irritants and by inducing bulk formation stimulates a normal physiologic peristalsis. It also acts as a protective colloid.

EXPERIMENTAL WORK

During the summer of 1934, Tompkins (8) became interested in treating infant diarrhea cases with the apple diet. The results were quite successful but several disadvantages to this method were observed:

1. Apples of good grade are scarce in the season when diarrhea is prevalent. Apples

that are available are rather expensive and a large part of each apple is wasted.

2. The diet was necessarily low in calories and of a one-sided nature, *i.e.* mainly carbohydrate.

3. It is difficult to feed apple to the very young infant. The diet was refused in many instances and gavage method cannot be resorted to with much success. It is necessary to scrape the apples just at the time they are fed, which makes the feeding problem time consuming.

4. Why feed the bulky apple when the same effect can be obtained by the use of the purified active principle?

From the results reported it seemed that pectin and the bulk factor contributed by the cellulose were the two active principles in the apple diet effective in treatment. With this in mind a pectin-agar-dextri-maltose powder was formulated. Later in 1936 Scheer reported an agar milk preparation which produced good results.

Tompkin's formula contains pectin in about three times the amount found in apple. The pectin-agar ration is such that when a pint of milk is added to a cup of the preparation, and cooked in a double boiler, a smooth self-supporting gel results. When combined with one and a half pints of milk, a tender gel is formed which when heated and agitated will make a smooth heavy liquid which can be taken from a bottle or used in gavage feedings. The method of preparation is simple. The desired amount of powder is combined with the previously boiled milk and heated in a double boiler over rapidly boiling water for ten to fifteen minutes with occasional stirring. While still hot, it is poured into the desired number of feedings, in bottles for the young child, or in cups for the older child. The caloric value is 51 calories per ounce if made as the stiff gel and 40 calories per ounce if used as the thick liquid feeding.

The pectin used is a pure commercial product obtained from the albedo of citrous fruit. Agar-agar was chosen as a desirable source of bulk and because of the consistency of its gel. Furthermore, since it does not liquefy at body temperature the gel state is retained as it passes through the gastro-intestinal tract. Dextri-maltose was chosen as the source of carbohydrate. These substances are mixed together dry. The end product is not noticeably hygroscopic and will keep for an indefinite period.

The formula has been made with milk as a basis in most instances and has been well tolerated. For the small child, the mixture is usually taken very well; however, for the older child we have found that it is best to flavor with vanilla, chocolate, peppermint, or various fruits, and often a little vegetable coloring is helpful. High caloric feedings for special cases have been devised and successfully used, calories being increased by the addition of eggs and powdered milk. Vitamin concentrates have been added in severe cases of malnutrition.

During the 1935 series, apple was used as the control. As far as possible, patients were treated in rotation. All other management was handled by the members of the inside staff. Accurate data was kept as to the type, number of stools, presence of blood, pus and mucus, weights of the child, temperature and amount and kind of food given. In the 1936 series, the same idea was carried out except that lactic acid milk was used as the control feeding. In this series it is of interest to note that 80 per cent of the cases were diagnosed as bacillary

dysentery. Since it is not commonly believed that dysentery is so prevalent in this section of the country, and since there has been no report in the American literature covering the use of various types of diets in an all dysentery group, we thought it advisable to report only the dysentery cases of the current year's work.

1935—All types of diarrhea

	Apple diet	*Pectin-agar formula*
Number of cases	18	24
Average age in months	10	22.4
Average number of stools daily prior to treatment	9.9	13.0
Average number of days on therapeutic diet	6.1	4.7
Average number of days until no liquid stools	4.1	1.3
Average number of days on transitional diet	7.1	3.9
Average daily weight gain or loss, grams	−50.0	75.0
Per cent of recurrences	33.3	12.5
Per cent bacillary dysentery	22.7	45.8

1936—Bacillary dysentery group

	Lactic acid formula	*Pectin-agar formula*
Number of cases	11	17
Average age in months	12.4	28.0
Average number of stools daily prior to treatment	15.5	14.2
Average number of days on therapeutic diet	10.3	9.5
Average number of days until no liquid stools	16.2	8.9
Average number of stools daily while on therapeutic diet	5.1	4.7
Average number of stools daily while on transitional diet	3.8	3.5
Per cent of liquid stools while on therapeutic diet	41.0	28.0
Per cent of liquid stools while on transitional diet	14.0	6.0

Although there is not complete agreement on the theoretical factors surrounding the exact action of this diet, we feel that the introduction of this pectin-agar preparation promises a very practical and worthwhile addition to the method of treating diarrhea in infants because it is:

1. High caloric—it is not a starvation diet and is helpful in treating marasmic babies with diarrhea.

2. Palatable—it has the flavor of a sweetened milk formula.

3. Adaptable—the formula components can be changed to give the concentrations and consistencies desired.

4. Balanced—it is not a limited carbohydrate diet.

5. Rapid transition—it is possible to make an easier, safer and more rapid transition to a normal diet. The child is already accustomed to a milk diet and a high caloric intake. The incidence of recurrences is much lower.

6. Inexpensive—the comparative cost per calorie is low.

7. Availability—the powder is available at all times of the year and not subject to seasonal supply.

8. Standardized—the composition is always the same.

9. Convenient—the preparation of the formula is quite simple and fits into the home and hospital routine.

10. Psychological—the baby is getting a "medicine".

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EDITORIAL

The School Cafeteria and Public Health

At no time in history has so much interest been displayed in the health of the public as at present. In many countries throughout the world the important place of nutrition in a health program is recognized by the leaders in the field of public health and a campaign for better nutrition is rapidly becoming a part of the national policies of the United States and many other nations. Much of this work has been fostered by committees of the League of Nations. Much has been the result: (1) of astounding information concerning the physical conditions among adults and children of the populations; (2) of the evidence that faulty nutrition is due to failure to utilize foods which may be readily accessible; and (3) of an appreciation of the economic factors of food production and distribution and the economic problems arising directly from them, problems involving not only the economic but the physical survival of all peoples.

Preventive work in public health emphasizes especially the necessity for the proper nutrition of children. Professor Wilson G. Smillie of the School of Public Health, Cornell Medical College, calls attention to this in a paper presented in this Journal, in which he says: "We are beginning to learn that the effects of malnutrition upon great numbers of our people are very real . . . retarding the development of unsuspected numbers of children and checking their full degree of physical and mental growth."

The necessity for proper feeding of children places school feeding in a vital position in regard to the health of the children and to the health education program. There is no more effective way to teach good nutrition as a part of good health than through the school cafeterias. In thousands of these millions of children may be reached. Here good food, at prices which they can afford to pay, must be provided for all children who eat at school. Such food aids in the proper nutrition of the children and serves also to train them in food habits which can be desirably maintained throughout adult life.

The opportunities for health and health education through the cafeterias are arousing wide professional interest. Sessions dealing with the problems peculiar to school cafeterias were held at the annual meetings of the American Home Economics Association and the American Dietetic Association, and groups of cafeteria directors have met recently in Boston and elsewhere. The American Association of School Physicians requested the American Dietetic Association to send a representative to its annual meeting to outline the means by which nutrition could be presented in the school program for the health of the school child. The National Association of Public School Business Officials devoted one session of its annual meeting to the topic of cafeteria management.

To realize the greatest possibilities of school feeding, the management of feeding units should be under the direction of the best professionally trained persons available. Dietitians are everywhere increasingly conscious of opportunities in this field and for this reason the February issue of this Journal will be

devoted to papers pertaining especially to school cafeterias.

The Twentieth Annual Meeting

An attempt to do justice in mere words to the delightful charm of Richmond and its people is "to gild refinéd gold". For never has there been such united effort, such ceaseless thought for the entertainment of the visiting dietitians, as at Richmond. All this was accomplished with ease and graciousness, for the art of hospitality is indeed in full flower in the South.

Truly, as Blanche Tansil said in her exquisite brochure descriptive of southern cookery and menus, "The early homemaker [and her descendents] with energy and ingenuity, made good cooking as well as gracious living a fine art". The land, itself, ably assists. For "every locality of the South offers a distinctive food to lure the epicure, and every season furnishes a picturesque setting for her varied cuisine". Thus North and South Carolina, Maryland and the District of Columbia, supplied the fresh apple cider, the wild black walnuts, the scuppernong grapes, the fried chicken, turnip greens, hot biscuits and spoon bread, with appropriate table decorations, at the welcoming luncheon. Florida, Alabama, and Texas contributed the tropical fruits and vegetables as centerpieces, the barbecued meat, the corn pone and the yams for the exhibitors' luncheon. Tennessee, Georgia, Kentucky and Louisiana joined forces for the Gulf Coast shrimp, the turkeys from Kentucky, pimientos from Georgia and sweet potatoes from Tennessee for the superb annual banquet, aided and abetted by the Sally Lunn bread, the "ambrosia" and sweets typical of these states. And finally Virginia, that grand old state, undaunted by all that had gone before, presented the buffet supper, typifying the great feasts and laden tables of Virginia's glorious past. Here the Lynnhaven oysters, the Brunswick stew, the Smithfield ham and the deviled crab came into their own, supported nobly by beaten biscuit and old fashioned potato salad, flanked by stuffed eggs and relish platter, and ending with the festive syllabub and its appropriate pound and spice cakes. And through this parade of the several southern states' choicest offerings, representatives of the various state dietetic associations provided a charming background of hospitality as hostesses.

Since the arts of food and music are akin, music, also typical of the Southland, served as a gentle background enhancing the enjoyment of the food. To one Northerner at least, "Carry Me Back to Old Virginny" will have greater meaning hereafter, having heard it sung by soft Virginian Negro voices at the annual dinner.

Again, words fail to convey the visitors' appreciation of the generous gift of an evening's music by the pianist, composer and Virginian, John Powell. Here the divine music of Beethoven, and that of Schumann and Chopin, together with Mr. Powell's own compositions based on traditional folk melodies, provided an evening of rare enjoyment.

The program of folk music by native Virginian musicians, with its "Devil's Dream", its "Walls of Jericho", its traditional country dances and its Uncle Jim Chisholm, was a fitting finale to a grand and glorious meeting.

The First Meeting of The House of Delegates

As further evidence of Richmond's and the South's wholehearted reception of their visitors, we may cite the marked honor paid the Association through inviting its House of Delegates to meet in the historic old Capitol of the State of Virginia, a building hallowed by memories of historic events and the brave deeds of men great in the history of the South and of the Nation. It was fitting that a daughter of the South, Evelyn Neale, president of the Virginia Dietetic Association, could be present to express in well chosen words the feeling of all Southerners toward the Capitol and the men who have been associated with it.

In contrast to a setting permeated with memories of past events and historic precedents, the Association's newly assembled House of Delegates met, in the words of Miss Troutt, "with no theories to fight, no precedents to follow, no officers to placate, nothing to prevent a perfect start in a new field. For our profession is a new field and the past of our organization is a short one, compared with that of professions of like importance and standing."

Yet first events, too, are impressive: "Collectors fight over first editions—which are usually full of mistakes", and "Even the lowly robin makes the front page each spring." Likewise, the Association's newly organized House of Delegates has this pristine quality of the first edition and the first robin. But more than this, it has as Miss Troutt said "a great opportunity to be a power in the American Dietetic Association, a power for the good of the Association."

The idea of a House of Delegates or its equivalent is not new to us, for it was first considered by Florence H. Smith in her presidential address in 1927 and made a reality through Katherine Mitchell's efforts when she saw the need for some reorganization in the Association's structure. Unhampered by a past, the future of the House of Delegates is in its own hands; its possibilities to strengthen and lead the Association limited only by its own abilities.

CURRENT COMMENT

Visual Education: Making and Using Motion Pictures in the Dietary Department[1]

This survey was made to determine the number of dietitians who were interested in motion pictures that could be used in their teaching program, and also how many had facilities for taking them.

Motion pictures on suitable subjects are helpful assets to education, whether of the community or in teaching the student nurse and dietitian.

The college student entering a hospital for her dietetic training has little conception of the many procedures in the hospital routine. Motion pictures can be used to show the different kinds of services and departments so that the student will have a better understanding of hospital procedure. Visual education also has unlimited possibilities when teaching nutrition in a community.

[1] This and the following two reports were presented before the Professional Education Section, Richmond, Virginia, October 20, 1937. Further information on available films may be obtained from Miss Koch.

There is a great need for the proper kind of educational film that can be used in a professional way for students as well as others. Those made by commercial companies have little value in an organized educational program, as they are either too entertaining or contain too much advertising.

A questionnaire sent to 500 of the larger hospitals throughout the country received 200 replies from dietitians. These replies stated that 180 institutions had no facilities for taking motion pictures. Twenty of the dietitians have cameras available or are able to borrow them from other departments in the hospital.

This group of 20 who were equipped to make a film, were most interested in material that could be used in teaching; only two had considered such possibilities in community education. They believed that the best procedure would be to show the kind of food service used in their hospital, and by so doing include the activities of the main kitchen, floor kitchens, diet kitchen and any other department or special equipment that would be necessary to complete this work. Three of the group were interested in showing their teaching program which included the nurses, student dietitians, out-patient clinic and parent groups.

Of the 180 hospitals that were unequipped to make films, 80 said they could use such films in their teaching program, while 100 did not think this would be feasible. Lack of equipment or funds were the usual objections to their use. Of the 20 hospitals that had some facilities and were in favor of such educational methods, 3 had completed films which were shown at the Richmond meeting.

The Children's Convalescent Home, Cincinnati, presented a film (16 mm.) entitled "Dietetics for Children and Parents" which gave a complete picture of the nutrition program now being conducted by a staff dietitian. The Children's Hospital, Cincinnati, has a teaching picture (8 mm.) showing the methods and procedures used in their nutrition classes. Memorial Hospital in Houston, Texas, has motion pictures (16 mm.) of the entire dietary department in operation.—CATHERINE KOCH, *Children's Convalescent Home, Cincinnati, Ohio.*

A STUDY OF STATE BOARD EXAMINATION QUESTIONS IN NUTRITION AND DIET THERAPY FOR STUDENT NURSES

A form letter was sent to the chief examiner of each state nursing board in the United States. In states having state dietetic associations, the letter was sent to the chief examiner by the chairman of the professional education section of the state dietetic association, requesting copies of questions in simple cookery, nutrition and dietetics as given by each state in its state board examination of 1935, and an analysis of the grades made.

Sets of questions were sent in from 28 states and from the District of Columbia; 7 could not release the questions and 13 did not respond in any way. Grade analyses of various kinds were received from 15 states.

The total number of questions studied was 2355. The length of the examinations varied from 5 up to 200 questions.

In 18 states questions were made out by a member of the state board of nursing education and in turn graded by her. Ten of the 18 states said their questions had been made out with the help of dietitians or state dietetic associations. Especially good cooperation was noted in 5 cases.

An example of such cooperation follows: The chairman of the professional education section of a certain state dietetic association and the member of this state's nursing board to whom the subject of dietetics was assigned, have been working together on state board examinations in nutrition and diet therapy for student nurses at the request of the state nursing board member. A series of questions was submitted by the chairman of the professional education section of the state dietetic association and from these the state board formulated the final questions. When the examination questions were sent in from this state, a personal letter was received from the state nursing board member expressing the gratitude of the board for the help of the state dietetic association, and stating that she felt their questions would be of a better type in the future because of this help.

Types of questions. The per cent of each type (in terms of the total number of questions) were as follows: True and False, 36 per cent; Completion, 23; Matching, 16½; Discussion, 11½; Multiple Choice, 7; and Single Choice, 6. Nineteen states are using only the objective type of examination; 13, a combination of the objective and subjective type of examination; one does not favor the true and false type of question; and one believes the completion type of most value. Three states have recently combined chemistry and dietetic questions. One combines questions in nutrition and diet therapy with questions in physiology, medical, surgical, hygiene, obstetrical and pediatric nursing.

Composition of questions. Of the questions 61½ per cent were on food (composition, costs, cooking) and the normal diet; 38½ per cent on modifications of the normal diet.

A graphic comparison between questions on particular subjects as asked in relation to the normal diet, and questions on these same subjects as asked in relation to modifications of the normal diet shows the following items of interest: (a) almost as many questions were asked about energy, carbohydrates, protein and vitamins in their relation to the normal diet as were asked with regard to modifications of the diet; (b) on the subjects of fat and cellulose, about 50 per cent more questions were asked on these subjects in relation to modifications of the normal diet than in relation to the normal diet.

Results of study of grade analyses submitted. In two states sending this information the passing marks were 55 and 75. Average grades in four states sending this information ranged from 80 to 95. Thirteen states sending this information stated that the percentage of failures varied from 0 to 18.

The reasons given for failures and low grades as stated by three states were lack of sufficient diet kitchen practice; too few trained dietitians in the hospitals of the state; and serious lack of knowledge of simple invalid cookery.—LEETA HOUSER, *Menninger Clinic, Topeka, Kansas.*

WHAT ARE THE REQUIREMENTS IN EDUCATION FOR THE STUDENT DIETITIAN?

The purpose of this study was two-fold: first, to determine what courses in Education were considered by heads of approved courses to be essential in the students' academic training; and second, an attempt to determine the adequacy of the students' academic preparation.

Thirty-five replies were received to a questionnaire sent to heads of approved training courses. From these replies the following general observations may be made:

1. The courses in Education considered of most value are: Educational Psychology, Principles of Education, Methods of Teaching in High School, and Observation and Practice Teaching in High School. It seemed obvious here that the importance of the word "essential" was not taken sufficiently into consideration since 14 of the completed questionnaires received checked from 5 to 9 courses as *essential* in the academic training. The above observation cannot, therefore, be considered as discriminating.

2. The students were found to be prepared academically, when they had a well rounded knowledge of available texts, of important periodicals and journals, and of the preparation of lesson plans for laboratory periods.

3. The students were *not* prepared with regard to preparation of course outlines; knowledge of available outlines; preparation of lesson plans for conference or discussion; preparation of lesson plans for individual instruction; and preparation and evaluation of tests and use of visual material. Other comments concerning this particular questionnaire represented too small a proportion of the total replies to warrant consideration—FLORENCE E. BATESON, *1273 Carlyon Road, East Cleveland, Ohio.*

MEETINGS OF HEADS OF HOME ECONOMICS DEPARTMENTS AND APPROVED TRAINING COURSES FOR STUDENT DIETITIANS.[1]

Heads of Home Economics Departments. The April 1 appointment plan for student dietitians was believed to be satisfactory as it gives the heads of the departments a chance to be well informed when making their recommendations.

As to the number of applications each student may make, it was generally agreed that three should be the maximum. Often students feel obliged to make more than three applications because they receive no replies to the inquiries, or because the replies are so delayed that in an effort to get placed they may apply to more than three institutions.

Withdrawals of students from appointments already made met with much discussion. There seem to be two reasons for withdrawals: first, a student may receive an appointment from an institution after she has already accepted an appointment in some other institution and the second appointment being more attractive than the first, she may withdraw from the first; second, an appointment for which a student has applied may be made long after the application and after the student has made other arrangements. More prompt attention to applications and correspondence from students may re-

[1] American Dietetic Association, Richmond, October 19, 1937.

lieve the situation to some extent, and form letters for reply were considered. Some believed there should be more uniformity in the type of recommendations sent out.

It was suggested that summer experience of six to ten weeks in hospitals be offered junior and senior students for the purpose of giving these students some idea of hospital dietetics so that they may make their plans accordingly. The plan met with general approval; many send their students for such experience and others are anxious to make arrangements to do so. Even in a small hospital not accredited for training, the experience enables the student to judge whether she is fitted for the work.

Some institutions are flooded with applications and others receive very few. This situation might be corrected so that home economics department heads will know where to advise their students to apply. This is one of the duties of the Business Office; one difficulty here is that some four hundred girls graduate within six or eight weeks and all want to be placed immediately. Frequently there is a delay on the part of the home economics departments in sending recommendations to the Business Office, especially during the vacation season. Thus it often happens that excellent students are not placed as soon as they should be. If there are no recommendations, or if these are inadequate, the Business Office can do nothing for the student.

With regard to the standardizing of courses in institution management, the American Home Economics Association is working toward this end and gradually assembling standards which will be helpful. If the school having a course in institution management does not belong to the accredited list of schools, applications from the students in the course should be refused.

The rating scale for standardizing reports of student progress might be made more intelligible and useful if it were understood that the *mean* or average student may develop into an entirely satisfactory dietitian. These rating reports should be made only at the end of the training course.

Other topics discussed were the type of experimental work offered the student, and the training in the use of scientific literature and bibliographies. Experimental cookery should be offered in the junior and senior years. Variations in the type of experimental cookery concerned terminology only and not the type of work presented. The importance of training students intelligently to use scientific literature and libraries was emphasized. Many students appear not to have had this training.

Heads of Approved Courses, Student Dietitians. Attention was called to the following recommendations included in the report of the chairman of the Professional Education Section: (1) that each course have an enrollment of at least four students; (2) that the dietary staff of approved training courses consist of at least three staff members; (3) that A.D.A. membership of all dietary staff members in the new approved courses be stressed; and (4) that in all newly approved courses at least one staff member should have attended an approved training course and thus be familiar with the Association's standards of training.

Directors of approved courses should cooperate with the colleges and uni-

versities and not make their appointments before April 1. A difficulty this year was the withdrawal of application after a student had been accepted in approved courses.

As a means of checking on the accredited status of universities and colleges, the following publications were mentioned: *Educational Directory* published by the Office of Education of the Department of the Interior; (2) *American Universities and Colleges;* and (3) *Government Bulletin # 16*, published in 1934. The registrars of state universities can give information regarding the status of colleges and universities. Approved course directors are expected to accept only students from accredited colleges.

With regard to the extent of class work to be given in approved course training, class hours should come within hours of duty. The amount of time spent in class work appeared to average from 1 to 3 hours a week during the year.

With regard to the rating form for student dietitians and the type of recommendation to be sent to the students' former home economics department, some home economics heads like to have the report as soon as the approved course director knows how the student is developing, while others prefer to receive the report at the end of the training period. An addition to the rating form was suggested, stressing nutrition habits of students.

Joint Meeting of Representatives of Approved Training Courses and Home Economics Departments. Following reports of the morning sessions of the two groups, it was agreed that: students' recommendations should be made before June or July; and that studies designed to develop the student's experimental attitude in cookery or other fields could best be conducted during the senior year. With regard to the last, this experimental point of view might be developed through metabolism experiments on the student herself or in work concerning a nutrition problem of children.

Elizabeth Perry of Cleveland told of the cost accounting system in her department. Most hospital superintendents are recognizing the importance of the dietary department more and more, not only because of the increasing emphasis on nutrition, but also because the food unit calls for such a large percentage of the budget.

With regard to the need for dietitians in state institutions, some states have civil service examinations for such appointments and others do not, but it was not until this last year that the civil service qualifications in New York State met the requirements of the American Dietetic Association. This followed considerable effort on the part of members of the state dietetic association. In training dietitians for positions in state institutions emphasis should be laid on quantity cookery and planning of economical menus.

BOOK REVIEWS

America's Cook Book. Compiled by The Home Institute of The New York Herald Tribune. New York: Charles Scribner's Sons, 1937. 1006 pp. Price $2.50.

This latest arrival in the cook book field is fittingly named, for those concerned in its preparation have been alert to the needs of the modern American household. They appear to have thought of everything, from menu planning, cookery methods, through a vast collection of excellent recipes, to table setting and service (one of the most complete chapters of its kind we have seen) and ending most appropriately with "The Herb Garden" and "The Well-Equipped Kitchen".

The more than 3000 recipes have been tested by home economics experts and homemakers and cover a wide range of cookery interests, including as they do, many excellent recipes of foreign extraction. The whole book is truly "geared to the modern kitchen" and to the use of modern food products. Basic recipes are stressed, from which variations are easily made. All recipes give the yield or number of portions; the arrangement conforms to present standards and the directions are lucid yet concise.

Other excellent features include glossaries of cookery terms with their explanation both in English and in French; a bibliography of references; tables of equivalents and substitutes; a number of menus for various purposes; purchasing guides for meats, fish, cheese, vegetables and other foods; and mineral, vitamin and calorie charts. The attractive format, with its excellent typography and illustrations, makes this an artistically pleasing book.

Experimental Cookery. By Belle Lowe. Second Edition. New York: John Wiley & Sons, Inc. 1937, pp. 60. Price, $4.50.

Although this book is written primarily as a text-book for college classes in food preparation or experimental cookery, the subject matter in it may also be used to great advantage in the scientific preparation of food in institutions, since it presents the newer knowledge of food preparation and cookery processes from a chemical and physical basis.

The first chapter contains a brief explanation of colloid chemistry in its relation to food preparation, the branch of physical chemistry that is used as foundation material in the remaining chapters.

Processes in cookery are discussed under the following subjects: Sugar Cookery, Freezing, Fruits and Vegetables, Jelly, Gelatin, Meat, Emulsions, Milk and Cheese, Egg Cookery, Flour and Bread, Batters and Doughs, Fats and Oils. A laboratory outline is given at the end of each of these chapters.

There is much of practical interest to the dietitian such as the range in fat absorption by doughnuts—19 to 37 per cent—depending upon several variables including proportion of ingredients, method of preparation and cooking temperature.—ELIZABETH COLE, *Montefiore Hospital, New York City.*

The Deuce of Reducing. By Katherine Mitchell. New York: Covici Friede, Publishers, 1937, pp. 112. Price $1.50.

The dietitian will and should read this book for its witty style, agile and spicy, but keyed to the times and her subject.

Such axioms as "the life-line is longer if the waist-line is shorter" will wean widening women from their whipped cream yearnings, when cold caloric computations might not.

For the rotund male, the line: "Is rescuing a lady's dropped glove [do they still do this, we ask?] a graceful as well as a gallant gesture?", may likewise act as a deterrent.

We have all heard: You are a dietitian, *how* interesting! Now do tell me what I should eat! This, coming from the owners of extra chins and billowy curves, led Miss Mitchell to do something about it. Her present book is the result, in which she tells what to eat, what not to eat, explodes magical reducing diets, points out the calories in cocktails, and completes her book with fool-proof menus.

A helpful introduction by Dr. Morris Fishbein further supplements Miss Mitchell's warning of the dangers of radical reducing without medical supervision.

Poisoning the Public. By Russell C. Erb. Philadelphia: Dorrance and Company, 1937, pp. 219. Price $2.00.

The recent calamitous results from the use

of certain elixirs of sulfanilamide should stimulate the reading of books such as this.

The author points out the present dangers from the use of habit-forming drugs, questionable home remedies and toxic cosmetics. Of particular interest to dietitians are the chapters detailing the poisons that lurk in foods through the use of containers, sprays and contact with harmful bacteria.

Other points covered are the dangers from the use of beverages containing toxic ingredients, the dangers from poisonous plants and poisonous animals, household poisons, including detergents, dry-cleaners, floor-polishers, etc., and the hazards of certain industries.

The final chapter on auto-intoxication might have had a more suitable title, for it covers more than the title might imply. A bibliography of source material is included.

Practical Dietetics. By Alida Frances Pattee. Mount Vernon, N. Y.: A. F. Pattee, 1937, pp. 868. Price $3.00.

Since its first appearance thirty-four years ago, Miss Pattee's text has continued to prove its worth through twenty-one editions. Many commendable features of earlier editions have been retained in this edition; namely, the rearrangement of subject matter as in the twentieth edition, and the preparation, reading and approval by eminent medical authorities of chapters in the diet therapy section. Thus the chapter on the anemias has been revised by Dr. William P. Murphy; that on arthritis, by Dr. Ralph Pemberton; that on diseases of the kidney and urinary tract, by Dr. James P. O'Hare. Likewise, the section on the principles of nutrition has been prepared with the assistance of leading authorities in the field of normal nutrition.

The Family's Food. By Faith Lanman Gorrell, Hughina McKay and Frances Zuill. Chicago: J. B. Lippincott Company, 1937, 2d. ed., pp. 630. Price $1.68.

The first edition of this book was reviewed in this JOURNAL March 1932. To meet the demands of the high school foods course of today it has been rewritten, enlarged and improved. The many problems of food selection, planning, buying, preparation, serving, management and nutrition pertaining to the family's food, is covered in an authoritative manner.

New features of the present edition include a simple and effective organization of subject matter, up-to-date emphasis on food management and the relation of food to health, and an entirely new chapter on consumer buying of food. The authors have carefully revised questions, activities, experiments and references in keeping with advancing knowledge.

The present edition offers an excellent text to assist the teacher of foods and nutrition classes in the high school.

The Weston-Levine Vitamin Chart. Published by the author, Roe E. Remington, Ph.D., D. Sc., Charleston, S. C. 7th. revision 1937. Price 10 cents.

This chart, originally published in 1931 and revised annually, appears to have been very favorably received. This latest revision covers the more recent progress in vitamin research and classifies the results of vitamin deficiency as specific and non-specific. The list of references has been limited to those most likely to be available to students of the subject.

Low Cost Food for Health. Prepared by Blanche F. Dimond assisted by the Nutritionists of the Community Health Association, Boston, Mass. Boston: The Community Health Association. 1937. 75 pp. Price 25 cents.

This is one of the best booklets of its kind that has yet appeared. As its title implies, it is designed for the family with small income. Within its 75 pages much ground is covered, from food requirements, meal planning, menus for a great variety of purposes, to buying, cooking, recipes and a complete index.

Food Values of Portions Commonly Served. Compiled by Anna DePlanter Bowes and Charles F. Church. Price 50 cents, on application to the authors at the University of Pennsylvania, Phila.

As the authors state in their foreword, the purpose of this book is to supply authoritative data on the nutritional values of food. The tables should prove helpful to those teaching nutrition to students of medicine, dentistry, dental hygiene and public health nursing. The food values are based on common measures or portions frequently served, which have been found most useful in such teaching.

Food in Health and Disease: Preparation, Physiological Action and Therapeutic Value. By Katherine Mitchell. Philadelphia: F. A. Davis Company, 1937, 2d. ed., pp. 379. Price $3.00.

From the very first chapter of this text the author has consistently demonstrated her sound understanding of the right psychological approach to her subject. Her statements are graphic, convincing, and concise. The nurse is not burdened with extraneous data or technicalities beyond her understanding and out of all proportion to her needs.

The arrangement of the material is easy to follow, aided as it is by the use of bold face and italic type center and sub-headings.

As the author states in her preface, revisions in this second edition, other than those concerned with the advances in nutritional and therapeutic knowledge, are chiefly directed toward a more thorough discussion of foods in the laboratory lessons.

How to Feed Children in the Home. By Mary E. Sweeney and Dorothy Curts Buck. Published by the Irradiated Evaporated Milk Institute, 307 North Michigan Ave., Chicago; copies free to those engaged in professional work and homemaking.

This excellent booklet is another by the authors of *How to Feed Children in Nursery Schools*. It answers the many questions confronting the mother of young children: how to correct faulty food habits; how to plan meals; and what are suitable foods for children. Recipes for the entire family are included.

Elementary Foods and Meal Preparation: A Laboratory Manual for College Students; and Advanced Foods and Meal Preparation. By Henrietta C. Fleck. Planographed, 48 and 52 pp., respectively. Price $1 on application to the author at the School of Home Economics, Women's College, University of Delaware, Newark.

The first of these manuals contains 29 problems beginning with laboratory procedures and covering Fruits, Cereals, Eggs, Milk, Leavening Agents, Baking Problems, Beverages, Meal Service of Family Breakfast, Vegetables, Soups and Salads, etc., with two problems in Canning and Preserving.

Miss Fleck has used the question and reading reference method of presenting the work, followed by an assignment in actual food preparation. The questions are pertinent and cover variations in composition, nutritive value, relative cost and the technics of preparation. References are given.

Advanced Foods and Meal Preparation is put out in the same form but treats of Outdoor Cookery, Laboratory Management, Tea Cakes, Good Social Usage, Meal Planning, Table Service and requisites for the same, Food Customs, Buffet Service, Formal Service, Experimental Cookery, Demonstrations, Exhibits and Publicity.

Due to the fact that her department is small, the author has combined many phases of foods work in the two manuals. The field covered is most comprehensive. It would seem more time might well be allotted to certain parts of the work in a larger institution, yet the manuals are carefully planned and very usable for a small foods department.—EMMA L. FEENEY, *Pratt Institute, Brooklyn, N. Y.*

CURRENT LITERATURE

American Journal of Digestive Diseases and Nutrition

Vol. 4, October, 1937

* Artificial fever in the treatment of ulcerative colitis: A preliminary report. L. K. Ferguson, F. Fetter and T. G. Schnabel.—p. 487.
* Food habits of the patient with peptic ulcer. M. Elder and E. S. Emery.—p. 493.
* The treatment of peptic ulcer by the diet of Goldberger and Wheeler. H. A. Warren, D. G. Friend and E. S. Emery.—p. 495.
* Dental caries and paradental disturbances. N. Simmonds.—p. 497.

ULCERATIVE COLITIS. Artificial fever treatments and a smooth diet appeared to give clinical and proctoscopic improvement in cases of ulcerative colitis. The patients' appetites improved and their weights began to increase. This method may not be a permanent cure but has produced rapid clinical improvement.

FOOD HABITS IN PEPTIC ULCER. If peptic ulcer is the result of some form of deficiency, that deficiency probably occurs not from faulty food habits but from a lack of some intrinsic factor.

PEPTIC ULCER. Five patients with peptic ulcer were placed on a diet low in animal protein, consisting chiefly of white wheat flour, cornmeal, hominy grits, cornstarch, white rice, granulated cane sugar, cane syrup, sweet potatoes, pork fat, cabbage, collards, turnips, turnip greens, and coffee with the object of trying to reduce the gastric acidity. None of the patients developed any change in their gastric analysis or blood findings. Such a diet might be used to reduce the gastric acidity, but it appears impractical for the treatment of peptic ulcer.

DENTAL CARIES. Although factors other than nutrition unquestionably play a rôle in dental and medical disorders, data suggest that a knowledge of a person's nutritional state is of importance in dental and medical work. A series of questions for securing a nutritional history is given. It must always be remembered that a person may be taking a highly satisfactory diet and yet be poorly nourished due to the poor assimilation of the dietary essentials.

American Journal of Diseases of Children

Vol. 54, October, 1937

* Stabilizing effect of increased vitamin B (B_1) intake on growth and nutrition of infants. M. W. Poole, B. M. Hamil, T. B. Cooley and I. G. Macy.—p. 726.
* Relation of increased vitamin B (B_1) intake to mental and physical growth of infants. M. G. Colby, I. G. Macy, M. W. Poole, B. M. Hamil and T. B. Cooley.—p. 750.
* Rate of apposition of enamel and dentin, measured by the effect of acute fluorosis. I. Schour and H. G. Poncher.—p. 757.

Vol. 54, November, 1937

* Blood sugar in diabetes in children. A. H. Kantrow and J. D. Boyd.—p. 1005.
* Respiratory metabolism in infancy and in childhood: XX. The nitrogen metabolism in premature infants; comparative studies of human milk and cow's milk. H. H. Gordon, S. Z. Levine, M. A. Wheatley and E. Marples.—p. 1030.

INCREASED VITAMIN B_1 INTAKE. An increase of from 30 to 50 per cent of vitamin B in a controlled formula of evaporated milk, water and corn syrup acidified by the addition of commercially dehydrated lemon juice powder, produced a greater regularity of growth. Increased amounts of vitamin B aided in promoting a more stabilized growth and greater nutritional stability. The average hemoglobin level for infants receiving the vitamin B supplement seemed to be more constant after the customary initial drop of the first few weeks.

MENTAL AND PHYSICAL GROWTH OF INFANTS. Infants receiving increased amounts of vitamin B showed accelerated maturation in basic behavior patterns, augmented alertness in attention and perception phenomena and slightly accelerated adaptive behavior patterns. All available data on vitamin B seem to indicate some close interaction between metabolism and development of external behavior.

APPOSITION OF ENAMEL. The effects of injections of small doses of sodium fluoride on growing teeth were studied in a hydrocephalic infant between the ages of 5 and 9 months. The dentin showed a stripe of disturbed calcification and the enamel showed a stripe of disturbed growth and calcification in the portion of the tissue which had been forming and calcifying at the time of each injection. In the deciduous teeth, a distinct ring of disturbed calcification was found in the enamel and the dentin. These rings are the neonatal rings in the enamel and the dentin and constitute a landmark which separates the prenatal and the postnatal portions of the deciduous teeth.

BLOOD SUGAR IN DIABETES. One hundred diabetic children were studied and their blood sugar responses at half-hour intervals compared with those of 90 nondiabetic children. Maximum reduction in blood sugar of nondiabetic subjects was observed within the first half hour, whereas in the diabetic subject the fall was prolonged into the second or third half hour or longer. An insulin tolerance test may prove as valuable a means of diagnosing the presence of diabetes as is the dextrose tolerance test.

RESPIRATORY METABOLISM. Balance studies of nitrogen and fat were made on six healthy premature boys ranging in age from 16 to 34 days. Four were fed equicaloric diets of human milk and mixtures of cow's milk which gave about 120 calories and 2.75 gm. of protein per kgm. The average amount of nitrogen retained in these short periods was 0.25 gm. per kgm. for the infants receiving human milk, and 0.27 gm. for the infants receiving cow's milk. These percentages are considerably higher than those reported for full term infants under comparable conditions. No defect in the absorption of nitrogen from human milk or cow's milk was found, the coefficients of apparent digestibility ranging from 80 to 90 per cent.

American Journal of Public Health

Vol. 27, October, 1937

* Staphylococci in raw oysters. J. C. Geiger and A. B. Crowley.—p. 991.
Is routine examination and certification of food handlers worthwhile? W. H. Best.—p. 1003.

Vol. 27, November, 1937

* Relationship of the diet to the self-regulatory defense mechanism—II. Lysozyme in vitamin A and in uronic acid deficiencies. N. P. Sullivan and I. A. Manville.—p. 1108.
* Education in nutrition by private agencies. J. A. Tobey.—p. 1124.

STAPHYLOCOCCI IN RAW OYSTERS. Although occasionally toxin producing staphylococci may be found in oysters, they are unable to grow in oysters and cannot produce toxin injurious to human beings. These observations are substantiated by the epidemiologic facts.

CERTIFICATION OF FOOD HANDLERS. Medical examinations of food handlers in New York City were discontinued as unsatisfactory after 18 years. Other measures such as the education of food handlers were substituted. Clean hands are perhaps the most important yet simplest expedient to prevent contamination. Instruction in handling food with tongs and forks, rather than bare hands, is of value.

DIET AND DEFENSE MECHANISM. Lysozyme is the body's natural defense mechanism against bacteria. The colon of the rabbit contains very much more of this substance than other parts of the intestinal tract. Vitamin A and uronic acid act as a trigger mechanism in the secretion of lysozyme in mucus. Animals deficient in these two factors can still produce lysozyme in their tissue but are unable to utilize it as a defense mechanism.

EDUCATION IN NUTRITION. Numerous sources of educational material on nutrition are now available to public health workers. The problem is to discriminate between the good and the bad. Nutritional facts issued by reputable trade associations and firms may be utilized to advantage in schools and health departments, when such material is reliable, accurate, well balanced, and free from too blatant sales and advertising motives.

American Journal of the Medical Sciences

Vol. 194, October, 1937

* Absence of peptic ulcer in pernicious anemia. J. R. Kahn.—p. 463.

Vol. 194, November, 1937

* The etiology and treatment of idiopathic hypochromic anemia. W. M. Fowler and A. P. Barer.—p. 625.
* Deficiency syndromes associated with chronic alcoholism. A clinical study. J. Romano.—p. 645.
* Insulin. C. Eggleston and S. Weiss.—p. 727.

PEPTIC ULCER IN PERNICIOUS ANEMIA. Hyperchlorhydria has been incriminated as a possible factor in the pathogenesis of chronic peptic ulcer. It is significant that none of 840 patients with pernicious anemia and its associated achlorhydria had peptic ulcer as a complicating factor.

IDIOPATHIC HYPOCHROMIC ANEMIA. Idiopathic hypochromic anemia, in most cases, is a chronic hemorrhagic anemia due to menstrual blood loss and an improper absorption of iron due to deficient gastric secretion with no evidence of faulty iron metabolism. Massive doses of iron produced a rapid hemoglobin response in this disease. Neither copper nor a liver fraction,

when given in addition to iron, increased the rapidity of hemoglobin production. Iron, administered intramuscularly in a tolerated dose, did not produce a hemoglobin response.

CHRONIC ALCOHOLISM. Fifty-eight per cent of the 131 chronic alcoholics studied presented some degree of neuritis. A history of inadequate food intake previous to admission was obtained in 79 per cent of those showing polyneuritis. Some degree of anemia was present in over half of the chronic alcoholics studied. Vitamins B_1 and B_2 were of definite value in the treatment of the deficiency syndromes associated with chronic alcoholism.

INSULIN. There are many extradiabetic uses of insulin. It stimulates the appetite and is of value in disease or health when necessary to increase body weight. Insulin, as a cure for schizophrenia, has been widely noted. Slow acting protamine zinc insulin is of value in the treatment of diabetes regardless of which of the various dietary regimens is used.

Archives of Internal Medicine

Vol. 60, October, 1937

* Gastric acid during recurrences and remissions of duodenal ulcer. C. F. G. Brown and R. E. Dolkart.—p. 680.
* Central nervous system and sugar metabolism: Clinical, pathologic and theoretical considerations, with special reference to diabetes mellitus. A. R. Vonderahe.—p. 694.

Vol. 60, November, 1937

* The adrenals and experimental pancreatic diabetes. J. M. Rogoff, H. W. Ferrill and E. N. Nixon.—p. 805.
* Influence of fat on concentration of sugar in blood and in urine in diabetes mellitus. M. Wishnofsky, A. P. Kane and W. C. Spitz.—p. 837.

DUODENAL ULCER. There is no significant trend in gastric acidity prior to a recurrence of ulcer activity. In the same patient the level for free acid may rise, fall or undergo no significant change before recurrence. During a recurrence, gastric acidity undergoes no constant variation. Upward or downward fluctuations occur in the same patient. Most recurrences were during the spring and fall months. The degree of distress may in no way be a criterion of the activity of an ulcer.

NERVOUS SYSTEM AND SUGAR METABOLISM. The proper understanding of diabetes mellitus as a clinical entity requires the inclusion of the central nervous system. Available evidence does not justify a view that diabetes mellitus is invariably caused by a lesion of the central nervous system. But clinical and pathologic data indicate that the nervous system becomes an integral factor in the cycle of events which constitute the phenomena of this disease.

PANCREATIC DIABETES. The supposed dependence of experimental pancreatic diabetes on secretion of epinephrine from the adrenals is not supported by substantial experimental evidence. Severity of diabetes in depancreatized dogs is not modified by reduction or suppression of epinephrine secretion from the adrenals. The requirement for insulin, when the diet is constant, is within the same range in depancreatized dogs as in dogs with a reduced or suppressed secretion of epinephrine in addition to pancreatectomy. Depancreatized dogs kept for several weeks on a constant diet with adequate amounts of insulin to control glycosuria sooner or later show a reduction or suppression of epinephrine output from the adrenals.

DIABETES MELLITUS. A review of the literature on diabetes mellitus is given. A strong impression exists that insulin is intimately concerned with fat metabolism. From experiments presented it is concluded that fat neither requires insulin for its metabolism nor does it inhibit or retard the action of insulin. The ingestion of large amounts of fat does not influence the fasting level for blood sugar of diabetics or normal persons.

Archives of Pediatrics

Vol. 54, September, 1937

* The vitamin B complex: a clinical and experimental study with special reference to growth and constipation. C. L. Joslin and S. T. Helms.—p. 533.

Vol. 54, November, 1937

* Nutritional edema in children. J. I. Waring.—p. 674.
* Effect of benzedrine sulfate on the basal metabolism of children. M. Molitch and S. Poliankoff.—p. 683.

VITAMIN B COMPLEX. Administration of an additional amount of vitamin B complex with special carbohydrate in the diet of infants during the first year resulted in increased growth and in relief of constipation. Administration of vitamin B complex to the nursing mother increased

lactation in 57 per cent of the cases. Addition of vitamin B complex to the diet in the form of a special cereal mixture produced increased growth in infants and children, caused an increased desire for food, and alleviated constipation.

NUTRITIONAL EDEMA. The cause of nutritional edema seems to be related to protein deficiency and a more general deficiency of dietary materials. Two cases cited illustrate some of the variations and show the cardiac changes which frequently accompany the general edema. One child responded well to dietary measures.

BASAL METABOLISM. Benzedrine sulfate in moderately high doses tends to increase the basal rate in children. Although the activity of the subject was carefully observed during the test, the increase in basal rate may possibly be due to an increased muscular tone or activity rather than to an increased oxidation as a result of direct stimulation of the cell.

Journal of Biological Chemistry

Vol. 121, October, 1937

* The relation of vitamin D to skin respiration A. K. Presnall.—p. 5.
* Abscess nitrogen metabolism in anemic and non-anemic dog. F. S. Daft, F. S. Robscheit-Robbins and G. H. Whipple.—p. 45.
* The effect of prolonged low protein diet on the serum lipids of dogs. I. H. Page, L. E. Farr and A. A. Weech.—p. 111.
* Fatty livers in the goose produced by overfeeding. E Flock, J. L. Bollman, H. R. Hester and F. C. Mann.—p. 117.
* Further studies on factor W. D. V. Frost and C. A. Elvehjem.—p. 255.
* Relationship of the blood cholesterol to the hemoglobin and serum protein. H. Schwartz and H. H. Lichtenberg.—p. 315.
* Studies on the rôle of bromine in nutrition. P. S. Winnek and A. H. Smith.—p. 345.

Vol. 121, November, 1937

* The relation of cystine and methionine to growth. M. Womack, K. S. Kammerer, and W. C. Rose.—p. 403.
* The cause of sore mouth in nephritis. S. Bliss.—p. 425.
* Studies on the presence of creatinine in human blood. B. F. Miller and R. Dubos.—p. 447.
* Determination by a specific, enzymatic method of the creatinine content of blood and urine from normal and nephritic individuals. B. F. Miller and R. Dubos.—p. 457.
* Effects of an anterior pituitary growth preparation on protein metabolism. O. H. Gaebler and W. H. Price —p. 497.
* The rate of change of alkali reserve after ingestion of salts of organic compounds. II. Rate of change of alkali reserve after ingestion of sodium citrate and sodium bicarbonate. J. Cape and E. L. Sevringhaus. —p. 549.

VITAMIN D AND SKIN RESPIRATION. The oxygen uptake of the skins of rachitic rats is only 60 to 70 per cent of that of the skins of normal rats. As the rachitic rats recovered from the disease the skin respiration improved and reached the same figure as the controls. This shows that vitamin D has an effect on the respiration of the skin and on its vitality.

ABSCESS NITROGEN METABOLISM. The normal non-anemic dog given a sterile abscess will show fever, leucocytosis, and a great increase in urinary nitrogen above the level of the simple fasting dog. The reaction in a dog which has been anemic for years is very different. The fever and leucocytosis are the same but the great increase in urinary nitrogen does not appear. The possibility that the lower nitrogen excretion by the anemic dog is due to conservation by recapture should be considered.

LOW PROTEIN DIET AND SERUM LIPIDS. Determinations of total serum lipid, total cholesterol, and lipoid phosphorus, and of the albumin fraction of the serum proteins, were made over periods of several months in five dogs. During the observations the diet was changed from one of adequate protein content to one very low in protein. Even when the low protein diet was continued so long that the serum albumin fell below 1.5 gm. per 100 cc. and gross edema occurred, the serum lipids were not consistently altered, either in their total concentration, or in the proportions of cholesterol and phosphatides in the lipid mixture.

FATTY LIVERS IN GOOSE. Very large and fatty livers and a greatly increased amount of depot fat may be produced in the goose by forced feeding of a high carbohydrate diet. This fat is definitely more saturated than normal, the liver fat being even more saturated than the depot fat.

FURTHER STUDIES ON FACTOR W. Further evidence is presented for the existence of a water-soluble vitamin in liver preparations, distinct from the known vitamins. This factor

has been temporarily designated as factor W. A method for the preparation of a concentrate of factor W from a 92 per cent alcohol filtrate of liver extract is described.

BLOOD CHOLESTEROL. Rabbits bled daily developed an anemia and hypercholesterolemia, but maintained the normal protein level of the blood. Nomal rabbits given a high fat-high cholesterol diet developed a very marked hypercholesterolemia unaccompanied by changes in the serum protein.

BROMINE IN NUTRITION. A synthetic diet has been prepared which supports growth in the rat and has a bromine content of less than 5 parts per 10 million. However, the growth was not equal to that of animals on the stock diet. In feeding experiments with this diet, no evidence was obtained that bromine is essential in the nutrition of the rat. The amount of bromine in the tissues of the animals depends not only on the amount of bromine ingested but also on the bromine-chloride ratio of the diet.

CYSTINE AND METHIONINE. For purposes of growth, methionine is capable of entirely replacing cystine in diets containing mixtures of highly purified amino acids. Contrary to the general belief, cystine is not an essential dietary constituent. Its presence does not improve the quality of a ration carrying an adequate amount of methionine. In the complete absence of the latter, the administration of cystine to the experimental animals fails to promote growth.

SORE MOUTH IN NEPHRITIS. The severe ulceration of cheeks and tongue seen frequently in nephritic patients and nephrectomized dogs may be due to local irritation by ammonia. Urease in the tartar of teeth acts upon the urea in saliva to produce this ammonia. When the concentration of urea in saliva is high, as it is in nephrectomized dogs, enough ammonia is formed by the enzymatic hydrolysis of urea to produce ulceration. The alkalinity of the saliva contributes to the liberation of free ammonia.

CREATININE IN BLOOD. True creatinine exists in human blood, constituting almost all of the chromogenic material in normal plasma.

CREATININE IN BLOOD AND URINE. In normal individuals creatinine constitutes 80 to 100 per cent of the chromogenic material in serum or plasma, and 30 to 50 per cent in the erythrocytes. In plasma from uremic patients there may be large amounts of non-creatinine, chromogenic material. In several patients, the absolute amount of such material seemed to parallel the severity of symptoms of the uremic toxemia. In urines from normal humans, and from patients with reduced kidney function, creatinine constitutes nearly 100 per cent of the chromogenic material.

GROWTH HORMONE AND PROTEIN METABOLISM. Large single injections of an anterior pituitary growth preparation produce changes in nitrogen, sulfur, and phosphate excretion similar to those which occur in conditions in which protein synthesis takes place. Changes in the nitrogen to sulfur ratio and sulfur partition of the urine are recorded and discussed in the light of various theories of protein metabolism.

RATE OF CHANGE OF ALKALI RESERVE. In normal subjects the plasma CO_2 rose by an average of 2.2 volumes per cent after the ingestion of 5 gm. of sodium bicarbonate and 3.8 per cent after the ingestion of 6 gm. of sodium citrate. The rate of plasma rise varied with individuals. The peak was usually reached in 30 to 60 minutes. These doses are the approximate equivalents of one liter of orange juice.

Journal of Laboratory and Clinical Medicine

Vol. 23, November, 1937

* Urinary iron excretion. A. P. Barer and W. M. Fowler—p. 148.

URINARY IRON EXCRETION. The urinary iron excretion of 100 men ranged from 0.09 to 1.29 mgm. per day while that of 100 women during the intermenstrual period varied from 0.08 to 1.63 mgm. per day. The average urinary output of iron was 24 per cent greater in women than in men. There was no apparent correlation between the urinary iron and the age of the individual nor between the volume of the urine and the urinary iron. Patients with idiopathic hypochromic anemia excreted a larger amount of urinary iron than any other group of patients studied. The amount of iron excreted in the urine was fairly constant in the same individual regardless of the iron intake.

Journal of Nutrition

Vol. 14, October, 1937

* The effect of the quality of protein on the estrus cycle. P. B. Pearson, E. B. Hart and G. Bohstedt.—p. 329.

* The effect of yeast on the liver glycogen of white rats during hyperthyroidism. V. A. Drill.—p. 355.
* Effect of adding copper to the exclusive milk diet used in the preparation of anemic rats upon their subsequent response to iron. M. C. Smith and L. Otis.—p. 365.
* Immaturity of the organism as a factor determining the favorable influence of lactose on the utilization of calcium and phosphorus. R. B. French and G. R. Cowgill.—p. 383.
* The effects of deficiency of phosphorus on the utilization of food energy and protein. E. B. Forbes.—p. 419.

Vol. 14, November, 1937

* The comparative nutritive values of glucose, fructose, sucrose and lactose when incorporated in a complete diet. H. H. Mitchell, T. S. Hamilton and J. R. Beadles.—p. 435.
* Activatability of milk as affected by feeding ergosterol to cows. R. F. Light, L. T. Wilson and C. N. Frey.—p. 453.
* On the survival of the completely depancreatized dog. I. L. Chaikoff and A. Kaplan.—p. 459.
* The respiratory metabolism of rats receiving a diet deficient in inorganic constituents. The change in basal metabolism. M. Kriss and A. H. Smith.—p. 487.
* Vitamins A, C and D in maize as affected by variety and stage of growth. W B. Esselen, C. R. Fellers and B. Isgur.—p. 503.
* The utilization of energy producing nutriment and protein as affected by deficiency of iron and copper. A. Black, O. J. Kahlenberg, J. W. Bratzler and E. B. Forbes.—p. 521.

PROTEIN QUALITY AND ESTRUS CYCLE. Rats maintained on a diet containing 5 per cent of casein as the chief source of protein soon cease to exhibit the characteristic vaginal changes of estrus. The addition of gelatin, rich in lysine, brings about only a partial response in the estrus cycle. When 5 per cent of gliadin, poor in lysine, is added to the low casein diet, ovulation occurs and the normal sex rhythm is immediately resumed. When the dietary protein is inadequate for growth the sexual behavior is likewise adversely influenced. No permanent sterility results from feeding diets qualitatively or quantitatively deficient in protein if the necessary stimulus for ovulation is subsequently provided.

YEAST AND HYPERTHYROIDISM. A group of rats on a normal diet containing 2.1 to 2.4 I.U. of vitamin B (B_1) per day and 2.4 to 2.6 I.U. of vitamin G per day gained in weight and showed normal liver glycogen values. When rats were given this diet plus 0.1 mgm. of thyroxin subcutaneously, they eventually lost weight and showed low liver glycogen values. If the units of vitamins B and G are increased enough the weight will remain constant and the liver will show normal glycogen values. The change in the vitamin content of the diet of the test rats, as regulated by the amount of yeast, is responsible for the normal liver glycogen value.

COPPER IN ANEMIA. Animals which do not have their iron reserves depleted in the presence of copper regenerate much more hemoglobin in response to subsequent iron and copper supplementation than do rats which have been given sufficient copper in the preparation period for complete utilization of iron stores.

LACTOSE AND CALCIUM UTILIZATION. The possible influence of the presence of lactose in the diet on the utilization of calcium and phosphorus was studied by means of balance experiments on two young dogs and one mature animal. Lactose in the diet of young animals favorably influences the utilization of calcium and phosphorus; no such result was obtained with the mature dog. The degree of immaturity plays a rôle in determining the effect of lactose on the utilization of calcium by a given organism.

NUTRITIVE VALUE OF DIFFERENT SUGARS. The differences in the metabolic disposal of sucrose, fructose, lactose and glucose and their different physiological effects, observed in growing rats when the sugars are administered alone, largely disappear when they are fed as components of a complete diet. Administered in a complete diet, the nutritive values of the sugars appear to be very much the same except for differential effects on the digestibility of the organic nutrients of the rations. Sucrose, fructose, and lactose do seem to favor the utilization of phosphorus.

ACTIVATABILITY OF MILK. The direct addition of 0.42 mgm. of ergosterol per quart of milk resulted in the milk attaining more than twice the antirachitic potency of normal milk when the two were given comparable exposures to ultra-violet light. Feeding ergosterol to cows did not result in an increased activatability of the milk on exposure of the milk to ultra-violet light. This indicates that plant sterols are not absorbed by mammals.

SURVIVAL OF DEPANCREATIZED DOG. When maintained with insulin and a high caloric, high protein, high vitamin diet, completely depancreatized dogs may survive for as long as 4 or 5 years. This length of survival makes it unnecessary to assume that raw pancreas or extracts thereof or choline supplements are essential for the survival of the completely depancreatized dog receiving insulin.

MINERAL DEFICIENCY AND ENERGY METABOLISM. The basal metabolism of young rats declined with increasing age during a period of approximately 3 months. The decline was most pronounced during the first month and was greater with the controls than with animals on the low-salt intake. Rats kept on a mineral deficient diet were less active and invariably had a considerably higher basal metabolism than their controls. The salt deficiency apparently had no effect on the respiratory quotients of the fasting rats, which may be interpreted to indicate that the effect on the metabolism was only in relation to the intensity.

VITAMINS IN MAIZE. There is a definite increase in the vitamin A content of maize plants as they grow. The vitamin C content of these same plants decreases with age. Fresh maize plants contain an antirachitic substance which is lost rapidly on storage. There is a marked loss in vitamin A and moisture in maize plants after they have attained maximum growth. This loss of vitamin A is a factor which should be taken into consideration when maize is grown as a feed for livestock.

IRON AND COPPER DEFICIENCY. Rats which received iron and copper deficient diets promptly developed typical cases of nutritional anemia. These rats digested more of the energy component and nitrogen of the ration, produced more heat, and stored more water than did those which received the iron and copper supplements, and also limited the food consumption of their normal pair mates. The rats which received the supplements of iron and copper, made greater gains in body weight, stored more energy, and gained more fat and nitrogen than did the anemic rats, with like intake of nitrogen and energy components. The hearts, spleens and kidneys of the iron and copper deficient animals were generally much enlarged.

Journal of the American Dental Association and Dental Cosmos

Vol. 24, November, 1937

* Experimental production of the diffuse alveolar bone atrophy type of periodontal disease by diets deficient in ascorbic acid. P. E. Boyle, O. Bessey and S. B. Wolbach.—p. 1768.

Diet of a patient with a fractured jaw. H. H. Weisengreen. p. 1855.

EXPERIMENTAL PRODUCTION OF PERIODONTAL DISEASE. Normal healing of wounds can occur only when adequate ascorbic acid nutrition is maintained. The essential characteristics of ascorbic acid deficiency and of diffuse alveolar bone atrophy pyorrhea are identical and may be summarized as an inability of bone and connective tissue to withstand functional stress. The tissues of the guinea-pig maintained on diets deficient in ascorbic acid resemble the diagnostic features recognized as characteristic of human diffuse atrophy pyorrhea.

DIET FOR FRACTURED JAW. In the case of the uninvolved jaw fracture, food must be of a smooth consistency. The diet should contain many vitamins and calories. Of equal importance is the need of maintaining appetite appeal. High caloric milk drinks, cereal gruels, fruit pulps and juices, meat broths and strained vegetables form the main part of the diet.

Journal of the American Medical Association

Vol. 109, October 9, 1937

* Diet and nephritis. Editorial.—p. 1202.
* Relation of nicotinic acid to human pellagra. Current comment.—p. 1203.

Vol. 109, October 16, 1937

* The use of calcium and the choice of a calcium salt. J. C. Aub.—p. 1276.
* The retention of iron. Editorial.—p. 1281.

Vol. 109, October 23, 1937

* Prognosis of diverticulitis and diverticulosis of the colon. P. W. Brown and D. M. Markley.—p. 1328.

Vol. 109, November 13, 1937

* The apple in the management of diarrhea in children. Council on Foods.—p. 1636.
* Minerals and intestinal flora. Editorial.—p. 1638.

Vol. 109, November 20, 1937

* Signs of vitamin A deficiency in the eye correlated with urinary lithiasis. W. J. Ezickson and J. B. Feldman.—p. 1706.

Vol. 109, November 27, 1937

* Vitamin D milk produced by feeding cows irradiated yeast. Council on Foods.—p. 1814.
* Mineral oil in foods. Council on Foods.—p. 1814.

DIET AND NEPHRITIS. Chronic nephritis can be induced in laboratory animals by the intravenous injection of a properly selected organ-specific nephrotoxic serum. From an investigation on experimental Bright's disease it was concluded that a progressive chronic nephritis in rats may follow a single toxic attack on the kidney. The severity and course of the resulting nephritis is markedly influenced by diet.

NICOTINIC ACID IN PELLAGRA. Nicotinic acid amide has recently been isolated in crystalline form from active liver concentrates. This compound is highly active in the cure of experimentally produced blacktongue of dogs. The possible clinical value of nicotinic acid and nicotinic acid amide in cases of human pellagra should be determined.

CALCIUM. Bones may be divided physiologically into two parts; the cortex, essential for posture, which apparently metabolizes at a fairly constant level; and the fine bone trabeculae, which represent an available storehouse for retention or liberation of calcium salts. The calcium and phosphorus levels in the blood stream remain fairly constant in health and in most diseases. The body storehouse of calcium is gradually depleted when the diet is acid ash or inadequate in either calcium or phosphorus. Excessive amounts of both thyroid and anterior pituitary secretion stimulate the calcium excretion to abnormally high levels. Vitamins C and D also influence the calcium retention. Calcium should be used in clinical medicine only in conjunction with the internal secretions and vitamins which influence its metabolism in the body.

IRON RETENTION. The total amount of iron in foods is not the sole factor in determining the amount of this element which is utilized by the organism. Prolonged diarrhea may lower the amount of iron absorbed. The amount of hydrochloric acid present in the gastric juice likewise affects the absorption of iron. Patients with achlorhydria retain much less iron than those with normal gastric acidity. Hydrochloric acid therapy in cases of achlorhydria is of little value as far as absorption and utilization of food iron is concerned. Large amounts of iron, as iron ammonium citrate, are absorbed and retained equally well by patients with achlorhydria and by those whose gastric acidity is normal.

DIVERTICULITIS. The diet in diverticulitis should at first consist of fruit juices, rice, jello, arrowroot cookies and eggs, but it should gradually be increased to a normal sensible diet. Vegetable purees may be given in the beginning but such a diet should not be continued indefinitely. Brain, whole wheat, popcorn, nuts and berries should naturally be excluded. Plain agar agar may be added to give bulk to the stools.

APPLE IN DIARRHEA. Many authors have found that regardless of the cause or seriousness of the condition the apple diet is one of the most successful measures now available for terminating both acute and chronic diarrheas. The mechanism responsible for the reported success of this diet is not clear. Apple powder when suitably prepared is a wholesome food and offers a convenient preparation for the management of diarrhea in infancy and childhood.

MINERALS AND INTESTINAL FLORA. Normally there is an enormous number of non-pathogenic bacteria in the intestine. Under usual dietary conditions, the predominating organism present is the colon bacillus which brings about characteristic changes in the unabsorbed residues of protein digestion. The aciduric group of bacteria, present in relatively small numbers, acts on various carbohydrates to produce lactic acid. Studies on albino rats show that when the other part of the diet is favorable, the presence of calcium and phosphorus is essential to vigorous growth of typical aciduric organisms of the intestine. The necessity for calcium and phosphorus in metabolism of living cells is reëmphasized.

VITAMIN A. Ninety-six per cent of the cases of renal urolithiasis were associated with vitamin A deficiency. Twenty-four patients who showed this deficiency were given vitamin A concentrate varying from 13,000 to 52,000 units daily over a period of from 6 to 9 months. Of the 15 who returned for restudy only one showed improvement in the dark adaptation test. Patients improved in general health, and in no instance

did an existing calculus increase in size or a new one form while the patient was under regular vitamin A and appropriate dietary treatment. Although vitamin A deficiency occurs in association with renal lithiasis it is dependent on lack of assimilation or utilization of this substance rather than on dietary deficiency.

VITAMIN D MILK. The feeding of irradiated dried yeast to cows results in secretion of vitamin D in the milk. Yeast must be fed two or more times daily rather than all at one feeding, the amounts depending on the amount of milk secreted. High producing cows are more efficient than low producing cows in transferring vitamin D from the food to the milk. The vitamin D content of metabolized vitamin D milk is not less than 400 units per quart.

MINERAL OIL IN FOODS. Mineral oil interferes with the utilization of vitamin A by experimental animals. The ingestion of mineral oil resulted in a considerable loss of vitamin A to the animal organism if the oil was administered with the source of vitamin A but not if the mineral oil were given at some other time of day. Different results are expected with different sources of vitamin A. Mineral oil has a marked effect on absorption of carotenes but has little effect on absorption of vitamin A itself. The indiscriminate use of foods containing mineral oil by persons who have loose bowels might cause further looseness and thus interfere with the utilization of other vitamin and minerals. The Council on Foods advises strongly against any indiscriminate dosage of mineral oil.

Northwest Medicine

Vol. 36, November, 1937

* Studies in urinary excretion and ascorbic (cevitamic) acid. E. N. Todhunter and E. Post.—p. 381.
* Vitamin B_1 and neuritis. K. K. Sherwood.—p. 385.

URINARY EXCRETION AND ASCORBIC ACID. The amount of vitamin C excreted daily in the urine of 7 college women was found to be related to the dietary intake. Two subjects, receiving little or no fruits and vegetables in their diets, excreted 10.58 and 14.36 mgm. daily; two, whose diets included some fruits and vegetables, excreted 29.32 and 23.69 mgm. daily, while three with high intakes of fruit juices, salads, and vegetables excreted 42.64, 60.23 and 83.72 mgm. daily.

VITAMIN B_1 AND NEURITIS. Except for acute deficiency of vitamin B_1 in beriberi there is no clear cut clinical picture of the disease caused by a lack of this vitamin. Vitamin B_1 is necessary for the complete combustion of carbohydrate in the body. In its absence, glucose and carbohydrates are incompletely burned, the end products being lactic and pyruvic acids. Besides beriberi, the lack of vitamin B_1 causes a decrease in the contractility of the heart resulting in cardiac enlargement and eventually in cardiac failure. Minor to severe grades of vitamin B_1 deficiency such as anorexia, constipation, edema and paralysis are of common occurrence in some localities. A number of cases of neuritis accompanying degenerative arthritis of the spine have been given general treatment. Relief was secured in 25 per cent of the cases and symptomatic improvement in 80 per cent.

Public Health Reports

Vol. 52, November, 1937

* General aspects and functions of the sick benefit organization. R. R. Sayers, G. Kroeger and W. M. Gafafer.—p. 1563.
* Treatment of psoriasis with massive doses of crystalline vitamin D and irradiated ergosterol. E. T. Ceder and L. Zon.—p. 1590.

ASPECTS AND FUNCTIONS OF SICK BENEFIT ORGANIZATION. Material obtained in connection with an occupational morbidity and mortality study which was begun in 1935 is presented. The medical records of about 550,000 members of sick benefit organizations were studied. A brief historical introduction relating to the different types of sick benefit organizations is given, and reference is made to the dates of establishments of these organizations, together with their geographic and industrial distribution, membership and service requirements, waiting periods, classes of membership, dues, benefit periods, sick benefits, reporting of disabling illnesses, and refusal of benefits.

PSORIASIS. Fifteen cases of chronic, widespread psoriasis were treated with 300,000 to 400,000 units of vitamin D from irradiated ergosterol daily. Eleven subjects obtained a complete involution in a maximum of 12 weeks, while two obtained only partial benefit and two showed no benefit. Massive doses of the preparations used appear to be relatively safe when administered to adults. The study suggests that this is a practical, simple, and effective treatment.

NEWS NOTES

Third Annual Conference Food Service Directors. The meeting on November 5 and 6 at the Hotel Statler was sponsored by the Massachusetts Dietetic Association and the New England Home Economics Association. Many of the papers from the program are to appear in this JOURNAL for February which will be devoted almost exclusively to the subject of the school cafeteria. Among the papers presented were the following: "Refresher Courses for Managers in Towns and Small Cities", Mary Spalding and Anna A. Kloss, Massachusetts Departments of Public Health and Education, Boston; "Standards of Postgraduate Training for College Graduates in School Lunchroom Management", Winning Pendergast, assistant director, Department of School Lunchrooms, Board of Education, Detroit; "Merchandising Good Food at Reasonable Prices", Henry W. Roberts, general manager, Colonnade Cafeterias, New York City; "Operating Lunchrooms with Pupil Satisfaction and Financial Success", Marion P. Rogers, Julia Richman High School, New York City; "Buying Specifications for Bread, Macaroni and Spaghetti as Used in School Cafeterias", Mary C. Kelly, cafeteria director, Hartford Public Schools, Hartford, Conn.; "Food Quality and Cost Control", Mary Farnam, director School Cafeterias, Cleveland, Ohio; "Food Technology", Samuel C. Prescott, Ph.D., dean of science and head of Department of Biology and Public Health, Massachusetts Institute of Technology; and "Merchandising Good Food at Low Prices", Rosa Spearman, director of School Lunchrooms, Board of Education, Dallas, Texas.

At the annual banquet, greetings were extended by Mrs. Beula Becker Marble, president of the Massachusetts Dietetic Association; Ernest Caverly, superintendent of Brookline schools; the State Commissioner of Public Health, representing the Commonwealth of Massachusetts; Dr. Henry B. Chadwick, Commissioner of Public Health for the State Department of Health; and Dr. Mary de Garmo Bryan of Teachers College, Columbia University. The address of the evening was given by Dr. George R. Minot, M.D., Nobel Laureate in Medicine, Boston.

A Food Technology Conference was held September 14 and 17, 1937, at the Massachusetts Institute of Technology. The procedures of the conference will be published in one of the coming issues of *Food Industries*. Among the papers of particular interest to dietitians were those of Dr. A. K. Balls and H. Lineweaver, Bureau of Food Research, U. S. Department of Agriculture, on "Effect of Low Temperatures on Enzymes" and Dr. D. K. Tressler, R. Jenkins and G. A. Fitzgerald on "The Vitamin C Content of Vegetables, and the Effect of Processing for Quick Freezing".

Interesting points brought out in the above papers were as follows: In freezing foods there is a measured decrease of enzyme activity until freezing point is reached when activity of enzyme is checked. Enzymes are not destroyed at low temperature although activity is checked. It is the freezing and thawing which causes disintegration of cells.

There is very little loss of vitamin C content of vegetables in the quick freezing process. Any loss is explained by processes preceding actual freezing or during storage.

The chief factors which affected various samples of vegetables tested were length of time between harvesting and freezing, difference in storage of vegetables during the time between harvesting and freezing and the length and method of blanching processes used.

It was also found there was quite a difference in vitamin C content in frozen vegetables thawed slowly at room temperature and those thawed immediately by plunging directly into boiling water, the latter method showing much less loss of this vitamin. All other factors equal, cooked quick frozen vegetables have exactly the same vitamin C content as cooked fresh vegetables, when served at table.

Quick freezing causes no injury to vitamin A in fruits and vegetables. It causes little loss of vitamin C, but the manufacturing operations before the freezing, such as shelling, washing, and blanching may cause as much as 50 per cent loss of this vitamin. However, once frozen, there is little further change at storage temperature of 9 to 20 degrees F. The defrosting of both vegetables and fruits, unless done quickly, is destructive to vitamin C. There-

fore frozen fruits and vegetables should not be defrosted until ready for use. Plunging the still frozen vegetables into boiling water reduces the loss of vitamin C to a minimum.

The Rollins Sandspur, published weekly by undergraduate students of Rollins College, Winter Park, Florida, has this to say in the November 24, 1937, issue under the heading "Beanery":

"An apple a day keeps the doctor away but who sees to it that we get the apple? In college we eat not so much what we want, we eat what is set before us—or we don't eat.... We are now away from home, but we are still at the mercy of the 'what-is-set-before-us' dictum. Before we scraped our feet for the last time on the family door mat, we heard of a very worthy class of people. They are called dieticians [sic]. We heard that these dieticians are trained in the arts of food selection and preparation, and are doing this work with a thought both for science and consumer satisfaction. We heard that these dieticians are employed by hospitals, sanitariums, clubs, restaurants, colleges, and other reputable organizations providing food throughout the country.... Their jobs are to prepare and serve wholesome and enjoyable meals on the understandings that an ounce of prevention is worth a pound of cure. ... An eating place of low calibre does not employ a dietician. They are interested solely in dollars and cents, instead of dollars and sense [The JOURNAL editor hopes this refers to eating place, and not to the dietitian]....

"We know that Rollins is a first class college. We are told that the Beanery is a first class eating establishment. We know—but do you—that there is no registered dietician connected with the aforementioned Beanery? We get our 'apple a day' only when those in charge happen to strike the right combination. Without being properly trained for such a job, the present 'Beanery bosses' have us at their mercy. We don't want to be forced to depend on mercy after we graduate; we want a registered dietician now. It would be a good advertisement for the college, and a great favor to us. After all, isn't Rollins known as a progressive college?"

American Public Health Association, in its *News Release* following the October 1937 Annual Meeting, states that a larger number of delegates was registered than at any previous meeting in the association's history. The total count was 3,549. The next highest register was at Chicago in 1928 when slightly more than 2,500 were registered. Every state in the Union was represented, as well as 18 foreign countries.

Dr. Arthur T. McCormack was inducted into the office of president and Mr. Abel Wolman, professor of sanitary engineering, Johns Hopkins University, was named president-elect. Dr. Thomas Parran and Dr. John P. Koehler were returned to the Executive Board and among those elected to the Governing Council were E. V. McCollum, Ph.D. and W. G. Smillie, M.D.

The 1938 Annual Meeting will be held in Kansas City.

United States Public Health Service announces that four northern counties of Arkansas have been selected as an area for a survey of pellagra now being conducted in cooperation with the Red Cross.

Golden Gate International Exposition, San Francisco, 1939. Members of the association making plans to attend the 1939 meeting of the American Dietetic Association, will be interested in the announcement of exhibits for the Hall of Science at the exposition. Emphasis will be placed on the prevention of disease rather than its treatment. National professional associations, well known clinics, universities and colleges are planning to cooperate in this exhibit.

Another exhibit will be under the direction of the American Dental Association in which the story of teeth and their connection with general health will be told. The American Veterinary Medical Association will also contribute a display showing how diseases may be transmitted to man from household pets and other animals. Industrial chemical companies will show the contribution of modern chemistry to scientific nutrition with all its import to the health of man.

Nutrition in Asia, distributed by the "World in Brief" 20 Vesey Street, New York City, in a recent descriptive folder, includes the following material available on application to the above address:

"The Nutritive Value of India's Foods and the Planning of Diets" by W. R. Aykroyd, Health Bulletin No. 23; tables on diet for the "poor and for well-to-do", prepared by the Child

PLANNED primarily for dietitians and teachers of Institutional Management for their use during the entire year, "Quantity Recipes" is being offered at this particular time with the thought in mind that this collection of tempting and most wholesome yet inexpensive dishes may be of service for holiday entertaining in schools, clubs and churches.

Among the sixty tested recipes in "Quantity Recipes" you will find new and delicious flavor combinations—novel treatments for well-known foods—skillful touches that transform old favorites into new creations as well as more nourishing versions of conventional dishes. Some high calorie recipes are also included. But of greatest value is the contribution which this collection of recipes makes in helping to put the much needed quota of milk per person into the diet.

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Welfare Society, Bombay; and publications from the Peking Union Medical College, and Lingnan University in Canton, on nutrition in China.

The Journal of the Indian Medical Association for May, 1937, carries an article describing a nutrition research laboratory at Coonor, India, by Dr. Aykroyd. The former director of this laboratory was Sir Robert McCarrison.

Congrès International de l'Insuffisance Hépatique has recently distributed condensed reports of the papers presented at the meeting in Vichy in September 1937. Summaries of the various papers are presented in several languages, including English.

New York Diabetes Association will open a series of six weekly lectures for physicians on "Modern Treatment of Diabetes Mellitus and Its Complications", endorsed by the New York Academy of Medicine, as follows: "Physiology of Carbohydrate Metabolism", William Chambers, Ph.D.; "Dietetic Management of Diabetes", Herman O. Mosenthal, M.D.; "Insulin and Protamine Insulin", James Ralph Scott, M.D.; "The Treatment of Diabetic Ketosis", Dana W. Atchley, M.D.; "Gangrene, Infection and the Management of the Surgical Diabetic", Beverly Chew Smith, M.D.; "Cardiovascular Diseases and Diabetes", George Baehr, M.D.

Bulletins on Tropical Fruits Shown at the Richmond Meeting. The University of Florida, the State Agricultural Experiment Station, the Department of Agriculture of the State of Florida, Tallahassee, and the Agricultural Extension Service at Gainsville, Florida, have prepared from time to time a number of publications on these many tropical and sub-tropical fruits. One in particular, entitled, *Florida Fruits and Vegetables in the Family Menu* by Mary A. Stennis, consultant nutritionist for the Department of Agriculture, State of Florida, Tallahassee, covers an interesting discussion including the use of the various fruits and methods of preparation. She has included the relative distribution of vitamins A, B and C in many of these fruits.

Jefferson County Tuberculosis and Public Health Association has employed Helen Osterbur, a graduate of the University of Illinois as county nutritionist, a unique undertaking in the State of New York.

To quote from the State Charities Aid Association bulletin, the purpose of the project is "to promote general community nutrition service for the protection of individual and public health and to provide consultation and information services in nutrition for the County Tuberculosis Hospital, physicians, health officers, public schools, welfare agencies, home bureaus, and other agencies in this rural county."

Miss Osterbur finished her student dietitian training in August, 1937, at the Grasslands Hospital, Westchester County, Valhalla, New York. Since then she has spent one month each as relief dietitian in the U. S. Marine hospital on both Ellis Island and Staten Island.

Her duties as county nutritionist began November 15, 1937.

Dr. Martha Koehne, director of the Nutrition Service for the Bureau of Child Hygiene, Ohio Department of Health, has prepared a series of pamphlets on the feeding of children and adults. One, entitled "What Shall We Eat?" is a discussion of both food facts and fallacies. Another is entitled "Forming Good Food Habits and Correcting Poor Ones." Three detail the feeding schedule for the infant from birth to two years of age, and one is a feeding schedule for pre-school children.

The Food Field Reporter announces the presentation to Dr. Henry C. Sherman of the annual scroll award for 1937 of the Associated Grocery Manufacturers of America at a meeting of the association on November 30 at the Hotel Waldorf Astoria. The award was granted by an advisory committee made up of Drs. Cowgill, Rose, Maynard, Dutcher and McCoy.

1937 Nobel Prize in Physiology and Medicine. Dr. Albert Szent-Györgyi, professor of medical chemistry in Szeged University, Hungary, was awarded this prize for his discoveries concerning vitamin C, particularly with regard to its isolation and the determination of its chemical nature.

Atlanta Dietetic Association met on November 6, 1937, at the Georgian Terrace Hotel with members of the Georgia Dietetic Association as guests. Eleanor Kellow, president of the Atlanta organization, presided at the dinner.

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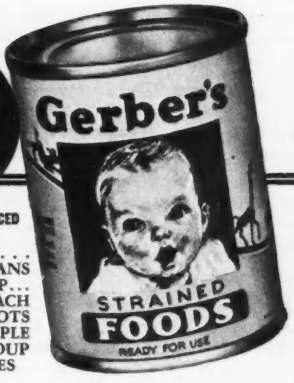

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Margaret Edwards gave the principal address of the evening on "Correlation Between the Activities of State Organizations and Those of the American Dietetic Association." Her talk will greatly strengthen Georgia's program of work.

Reports of the Richmond meeting were given by state representatives. Peggy Newsom, president of the Georgia Dietetic Association, gave an account of the sessions of the House of Delegates. Lucia Hunt, Clara Hasslock and Gladys Stoddart gave reports of sectional and general sessions.

Eleanor Kellow reported briefly on the Chicago meeting of the American Restaurant Association.

Members of the American Dietetic Association who were fortunate to attend the annual dinner of the Association at Richmond, may be interested to know that the small jars of pimientos, adorned with a silhouette of the state of Georgia, were gifts of Mr. Walter Graefe, president of the Pomona Products Company, Griffin, Georgia.

Iowa Dietetic Association met November 4 at Hotel Des Moines, Des Moines, jointly with the State Teachers' Association. Professor Fern Gleiser, head of the Department of Institution Administration at Iowa State College, presided at the sessions for which Mary Louise Longmire and May Morris, dietitians at the Iowa Methodist Hospital, arranged the excellent program. Ruth M. Kahn of Washington Medical School Clinic, St. Louis, secretary of the American Dietetic Association, was the guest of the state group.

Eunice Longworth of the hospital staff at the University of Iowa, state representative at the national meeting in Richmond, gave an excellent explanation of the organization and purpose of the House of Delegates. Lenore Sullivan of Iowa State College talked on the subject "Modern Trends in Quantity Cookery". Miss Sullivan has recently published a quantity recipe file containing recipes tested and used in the institution tea room at Iowa State College.

The luncheon speaker, Mr. Charles T. Cownie, president of Cownie Furs, recounted interesting food experiences while on an extensive European trip the past summer. Ruth Kahn, aided by charts, graphically portrayed the wide scope of the dietetic field, including the possibilities for a consultant dietitian. Dr. E. B. Winnet and Dr. H. D. Kaumper of the Iowa Methodist Hospital Staff, presented interesting material on the dietary treatment of diabetes and anemia.

The April meeting will be held at Burlington, Iowa.

Massachusetts Dietetic Association. The October meeting was held at Massachusetts State College, Amherst, with a program arranged by Helen Mitchell. Following tea at the home management house, The Homestead, "Some Public Health Aspects of Food Handling" were discussed by Dr. James Fuller, assistant research professor of bacteriology; and "Stability of Vitamins to Different Types of Food Processing" by Dr. Carl Fellers, research professor, horticultural manufactures.

On November 9, Maniza Moore and others who went to Richmond gave a lively convention report under the title "Proxies in Dixie".

At the request of the United States Public Health Service and the Children's Bureau, Simmons College has this year given advanced training to two nutritionists appointed in state health departments under the Social Security Act. The program offered by the School of Home Economics during the first half of the academic year included three days a week of field work in the Massachusetts Department of Public Health, the Community Health Association, and other agencies. The students who have just completed this course are Clare Hartnett, Washington, and Minnie Walters, Alabama.

Several association members attended the monthly nutrition seminar directed by Dr. Alice Blood under the sponsorship of the New England Home Economics Association, Social Workers' Section. Ada Berning, nutritionist with the Community Health Association, is section chairman.

The new Converse wing at the New England Baptist Hospital has been opened. Isabel Cook, former student at the Massachusetts General Hospital, is the dietitian.

The dietary department will occupy one entire floor of the George White Building, a sixteen story unit of the Massachusetts General Hospital, now under construction.

Jean Ritchie of the Edinburgh Infirmary, Edinburgh, Scotland, is taking a three months

2 SIMPLE WAYS

of Preparing Palatable High Concentrations of KNOX GELATINE

PHYSICIANS are constantly asking us for formulae for the preparation of Knox Gelatine in a concentrated palatable form, useful in the dietary treatment of such conditions as muscle fatigability and gastric ulcer. Research on such formulae has shown these to be excellent.

"The Knox Milk Stir"

Place the contents of 4 envelopes of Knox Gelatine in an ordinary drinking glass. Add 4 ounces of cold milk and allow to soak for five minutes. Add 2 more ounces of milk and stir until homogeneous. Then place glass in small cooking kettle of hot water until gelatine milk mixture liquefies. Add 2 more ounces of cold milk, which will bring the temperature to a satisfactory warm drink of about body heat. A tablespoonful of prune juice or a few drops of any bland flavor like vanilla may be added.

Total: 8 ounce liquid—75 calories

"The Knox Fruit Stir"

Place the contents of 2 envelopes of Knox Gelatine in an ordinary saucer or cereal dish. Add 8 tablespoonfuls of any desired fresh or canned fruit juice, such as grape juice. Let soak for five minutes and eat with teaspoon.

Total: 4 ounce mixture—50 calories

They are ideal when frequent feedings and extra calories must meet adequately the level of nutritive requirement. Indicated to allay the pain in the gastric ulcer patient when given hourly. An adequate food adjunct both from the standpoint of easy digestibility or "low residue" in gastro-enteric dysfunction or intestinal stasis. Also of value for their high amino-acetic acid (glycine) content in dystrophic muscular conditions.

Why You Should Insist on Knox Sparkling Gelatine

Because Knox Gelatine is 85% protein in an easily digestible form—because it contains absolutely no sugar or other substances to cause gas or fermentation, Knox Gelatine should not be confused with factory-flavored, sugar-laden dessert powders. Knox is 100% pure U.S.P. gelatine. Knox Gelatine has been successfully used in the dietary of convalescents, anorexic, tubercular, diabetic, colitic, and aged patients.

KNOX SPARKLING GELATINE

IS PURE GELATINE—NO SUGAR

KNOX GELATINE LABORATORIES
JOHNSTOWN, NEW YORK

post-graduate course at the New England Deaconess Hospital, Boston.

Deborah Newton Geller, formerly on part time service in the Food Clinic of the Massachusetts Memorial Hospital, Boston, became a full time member of the staff December 1.

The Boston Dispensary Food Clinic graduate course for student dietitians has been approved by the American Dietetic Association. Two students are enrolled this year. Part time students at the clinic are Dr. Vilma Sebasta, Hungary; Mitsuko Ariki, Japan; and Aurora Sutianu, Roumania.

Applied Dietetics by Frances Stern, published by Williams and Wilkins, is going into its second printing.

Low Cost Food for Health (available for 25¢), an attractive 70 page booklet, has recently been prepared by Blanche Dimond, nutrition supervisor, and the nutritionists of the Community Health Association, Boston. Its recipes and suggestions for meal planning, food budgeting, and marketing, offer timely help to "the many women with small incomes who are struggling to provide wholesome food for their families". It is also a practical aid in staff education.

Caroline Rupe substituted during November at the Free Hospital for Women, Brookline.

Helen Blake is now assistant dietitian at the Mary Hitchcock Hospital, Hanover, New Hampshire.

Marcia Scott has gone to the Jackson Memorial Hospital, Miami, Florida, as assistant dietitian.

Hildegarde Osterlund, a recent graduate of the Massachusetts General Hospital student course, has a position at the Burbank Hospital, Fitchburg, Mass.

Helen Fincklestein, Boston Dispensary Food Clinic, was associated with Dr. Joseph Rosenthal in a study recently reported in the *New England Journal of Medicine* entitled "Treatment of the Ambulatory Diabetic Patient with Protamine Zinc Insulin".

Minnesota Dietetic Association met in Duluth, November 6. Miss Gregerson, chairman of the administrative section, planned this meeting with Miss McLeod of St. Luke's Hospital, Duluth.

Following a luncheon at Casa-Del-Norte, a meeting was held at St. Luke's Hospital. Lucile R. Townsend, the president, introduced Mr. Andreson, who spoke on coffee, illustrating his talk with moving pictures. Lucile Townsend reported on the Richmond meeting, and Mrs. Winifred H. Erickson reported on the American Public Health Association meeting held in New York City. Chrissa Wendt then read a paper on "Electrical Equipment" by Lute Troutt, who was unable to be present. A discussion of various administrative problems followed in which most of the dietitians contributed interesting items. Immediately after the meeting, the members adjourned to the Nurses' Home to attend a tea with Florence Ames of Casa-Del-Norte, assisted by the Duluth dietitians, as hostesses. A dinner followed at the Lincoln Hotel. Dr. George Primmer of the Duluth State Teachers' College was the speaker of the evening, and his topic, "Isle Royal and the North Shore".

Montana State Dietetic Association held the fourth annual meeting at the Placer Hotel, Helena, November 13.

Mildred Leigh of Montana State College presided at the meeting, which was preceded by a luncheon. A short business session and election of officers for the ensuing year was held. The following officers were elected: president, Rita E. Black, St. Peters Hospital, Helena; vice-president, Jeanne Tellier, Eddy Baking Company; secretary, Mila Tanner, Murray Hospital, Butte; and treasurer, Olive Bartlett, Bozeman Deaconess Hospital, Bozeman.

Dr. Jessie Richardson of the Montana Agricultural Experiment Station, was guest speaker, and her subject, "New Research of Interest to Dietitians".

Arrangements for the meeting were made by Miss Black assisted by the following: Jeanne Tellier, Stella Helming, Ada McGinley, Dorothy Ford and Viola Krause, all of Helena.

Nebraska State Dietetic Association met in Lincoln, November 5 and 6. Ruth M. Kahn, of Washington University Medical Clinics, was the guest of the association and speaker at the evening session November 5. Her talk on "New Fields of Endeavor for Dietitians", was informative as well as inspirational.

Stella Fiijan, formerly of Charity Hospital, New Orleans, spoke on "Dietary Customs of the South", illustrated by case studies showing

You Get What You Pay For

An article by

Mrs. Howard Chandler Christy

MRS. CHRISTY, *wife of the famous artist, is a national leader in women's educational and economic affairs. In addition to her many other activities, she has a lively interest in cooking.*

A DOG LOVER, motoring in the country one day, was approached at a traffic stop by a peddler with a basketful of jet-black puppies which he claimed were pure-bred Newfoundlands. He was sacrificing them for the low price of $10 apiece. The motorist, convinced that he had run into a bargain, just couldn't resist buying one of the pups.

From his first bath, however, the puppy emerged with a coat no longer solid black, but with strange-looking spots of dirty gray. And as the months went by, he looked less and less like a well-bred Newfoundland.

It was quite apparent that the puppy had been dyed to simulate a black Newfoundland. In his haste to strike a bargain, the man failed to realize that dogs, like everything bought and sold today, have a well-established value. You get what you pay for.

* * *

AND THAT is just as true of baking powder as of any other purchase. Royal Baking Powder is made with Cream of Tartar, a wholesome fruit product, and is well worth a little extra cost. I love to cook, and I know, from long experience, that Royal gives a finer flavor and texture. Every baking recipe in a cook book I am now writing is planned for this fine Cream of Tartar baking powder.

The Cream of Tartar in Royal assures finer flavor . . . better keeping qualities

WHEN you buy baking powder, you do have to face the fact that you must pay a little more for Royal—the Cream of Tartar baking powder. But you get what you pay for—in finer flavor, more even texture . . . and no waste.

The Cream of Tartar in Royal is a wholesome, pure fruit product. It guards against unpleasant baking-powder taste . . . brings out all the flavor and goodness of your fine fresh butter, eggs, milk and flavorings . . . assures perfect results every time.

ROYAL is the only nationally known baking powder made with Cream of Tartar—a pure fruit product from luscious, juice-heavy grapes.

When you make up your next order for supplies, be sure to specify Royal—the Cream of Tartar baking powder that has been the standard of unfailing quality for more than 70 years.

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the influence of the people's diet in producing pellagra and beriberi.

Mrs. Maude Nuquist, a member of the Board of Control, spoke on "Food Service in State Institutions" and stated that dietitians are being placed by the board in order to improve the food service in state institutions. During the past year the Board of Control for the eighteen state institutions in Nebraska has appointed Winifred Yates as state dietitian. She in turn has placed dietitians in the large state hospitals. The dietitians recently appointed to these positions are Bertha Magee, State Hospital, Lincoln; Stella Fiijan, Hastings State Hospital; and Lucy McCurly, Beatrice State Hospital.

The entertainment features of the convention consisted of a dinner at which Martha Park was hostess, and a luncheon sponsored by Elvira Haas. Leta B. Linch, dietitian at the Lincoln General Hospital, presided throughout the meeting.

The new officers elected were: president, Margaret Stuart; vice-president, Angeline Phillips; secretary, Ardelle Wick; and treasurer, Bertha Magee.

New Jersey Dietetic Association. Members attending the A.D.A. convention at Richmond were Isobelle Stewart, Hulda Luthman, Mary Neil, Estelle Banta, Alberta Dent, Geraldine Parry, Sally Mooring, Inez Somers, Katherine Booth, Helen Markley, Sarah Benedict.

Officers elected at the recent meeting were the following: president, Sophia Morris, Beth Israel Hospital, Newark; vice president, Geraldine Parry, Hackensack Hospital, Hackensack; secretary, Margaret McCoy, 223 Lincoln Avenue, New Brunswick; and treasurer, Sally Mooring, Morristown Memorial Hospital, Morristown.

Greater New York Dietetic Association. The association met on November 22 at the Red Cross Building, with the following program: Virginia Hamill, home furnishings and decoration editor of the *Woman's Home Companion*, "A Colorful Table is an Appetizing Table"; and Dr. William S. Langford of the Vanderbilt Clinic, "Behavior Problems in Child Feeding".

At the dinner meeting on December 13, at the Hotel Shelton, Anna Steese Richardson, director, consumer division, Crowell Publishing Company, discussed "The Consumer Must Be Served".

A theater benefit is scheduled for January 17 and 18 when members will attend the play "Julius Caesar".

Philadelphia Dietetic Association met in October at Mount Sinai Hospital for the first meeting of the season. Invitations were issued to representatives from the League of Nursing Education, and to superintendents and instructors in nurses' training schools. Hendrika J. Rynbergen, instructor in dietetics at the New York Hospital, gave an interesting and human account of her teaching experiences entitled "Modern Methods of Teaching Student Nurses". Miss Rynbergen conducted a discussion following her talk.

Henriette Pribnow, president of the Philadelphia Dietetic Association and recently appointed director of the dietary department at Hahnemann Hospital, addressed a Career Conference held for home economics students at Beaver College. Miss Pribnow stressed the importance of attaining the A.D.A. requirements before graduation from college and also the benefits derived from membership in the Association.

On November 9, at Jefferson Hospital, Dr. Guy M. Nelson, assistant to Dr. Martin Rehfuss, gave an address on "Diet in Relation to Gastro-intestinal Disease", in which he expressed the appreciation of the physician for the dietitian's aid in carrying out an ordered diet.

The association announces the completion of a project in racial diet which has been carried on for over a year by Mrs. Anna De Planter Bowes and her committee. There are copies available of the diets and price lists, including those of October 1937, and food calculations showing adequacy, etc., for five cents a copy.

The association was invited to attend a session of the Philadelphia Metabolic Association on November 12 to hear Dr. Walter Karr speak on "Nutrition in Relation to the Vitamins"; and Dr. Edward Rose on "The Relation of the Thyroid to Disorders of Metabolism and Nutrition". This is one of two open meetings to be held with nutrition as the general subject matter.

The Consumer's Forum met at the Warwick Hotel, November 30, with the local association as one of the sponsors. Problems concerning

3-YEAR INVESTIGATION ON SLEEP..

An extensive series of sleep experiments have recently been conducted in a leading University

THIS STUDY SHOWS THAT OVALTINE ALONE, OF ALL THE THINGS TESTED, IMPROVED THE *QUALITY* OF SLEEP

Three years ago an extensive investigation was begun at a well known University, to determine the influence of certain factors on sleep. 36 men and women were used as subjects in this study, which extended over a total of 6,800 sleep nights.

A wide variety of different factors were tested for their effect on sleep. One phase of the general problem was to study the influence of sandwiches, hot milk, two barbiturates, and Ovaltine. (Ovaltine was included in the study at the recommendation of the investigators).

Statistical evaluation of the results shows that Ovaltine was the only test procedure which improved the quality of sleep. *It decreased the amount of tossing and turning during the night.* (Motility, i. e., movements during sleep, is recognized as an objective criterion of the restfulness of sleep). In addition, *Ovaltine caused an increase in the number of mornings when the subjects reported they felt well rested on awakening.* These results were obtained when Ovaltine was taken hot or cold, with water or milk, thereby indicating that it was Ovaltine itself that caused the improvement in sleep.

Ovaltine was the *only* test procedure that accomplished these two favorable results. Sandwiches had no effect on the quality of sleep. Hot milk had no effect except to increase the amount of dreaming. The two barbiturates used gave the effects for which they are known—one a quick sedative action and the other a prolonged depressant effect, fortifying the accuracy of the test. But neither drug improved the quality of sleep as did Ovaltine.

These findings with Ovaltine are merely confirmation, from a new and scientific method, of facts long known about Ovaltine. The experience of medical men established the use of Ovaltine for sleep many years ago.

Ovaltine is a nourishing food, not a drug. Its action is, therefore, entirely natural. It can be used regularly, night after night, with no danger of forming a drug habit.

When you wish to recommend a sleep aid to some patient, why not give Ovaltine a trial? It is a safe and drugless aid to sound, restful sleep.

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new hours, standards and consumers' viewpoints are to be discussed at three major meetings.

During the summer, Martha Alderman, for the past two years the president of the association, became Mrs. Homer Hunscher.

The association announces a larger total membership than last year, and that 35 new members have been recently accepted.

Rhode Island Dietetic Association. Fifty-five members of the association met for the annual dinner meeting with Dr. Mark D. Elliott of the Forsyth Dental Infirmary and Harvard Dental School as speaker. Dr. Elliott discussed the results of the several forms of avitaminoses. Among the guests at the speakers' table were Dr. Edward A. McLaughlin, director of the State Department of Health, Dr. Francis V. Corrigan, chief of the division of child hygiene, and Florence B. Caton, supervisor of home economics in the public schools of Providence.

The association voted to form a Rhode Island State Nutrition Council. Mrs. Jarvis D. Case, president, was directed to appoint a temporary governing body.

St. Louis Dietetic Association met in September for the first meeting of the year at the St. Louis Jewish Hospital. Officers elected were as follows: president, Mrs. Gladys Silkey, Firmin Desloge Hospital; vice-president, Mrs. Theodore Stebbins, Koch Hospital; treasurer, Isabel McMenamee, St. Louis City Sanitarium; and secretary, Grace Zerbolio, Barnes Hospital.

The October meeting was held at the Jewish Hospital. Ralston Purina Company presented "Where Chick Life Begins", a movie made at Cornell University under the supervision of Professor Alexis Romanoff.

The Pevely Dairy gave a picnic in October for the association at the Pevely Farms.

The Richmond meeting of the American Dietetic Association was carried out in miniature at the November meeting of the association under the supervision of Mrs. Gladys Silkey, president. The group met in a private dining room of the St. Louis University School of Medicine. In the receiving line were Mrs. Silkey and her student dietitians, appropriately dressed in old southern costumes. After the guests arrived, they were seated to the tune of "Dixie". They found at their places a menu card depicting the gate of the Governor's Palace in Williamsburg, and on opening the gate the following menu was displayed:

Colonial Pimiento Bisque
Thanksgiving Canapé
Baked Virginia Ham, Wine Sauce
Candied Yams
or
French Fried Oysters
Baked Stuffed Potato
Broccoli with Lemon Sauce
Cranberry Salad, Fruit Salad Dressing
Hot Biscuits, Blackberry Jam
Persimmon Parfait
Southern Cocoanut Snow Balls
Coffee

Between courses, entertainment by the student dietitians was furnished in the form of southern folk songs and an old southern monologue.

A short business meeting was then held, and the meeting ended with the dancing of the Virginia reel and the singing of "Goodnight Ladies". The group gave Mrs. Silkey and her assistants a vote of thanks for portraying true southern spirit and hospitality.

Texas State Dietetic Association. Reid Murdoch Company, Houston, was host to the members of the South Texas Dietetic Association at the November meeting. Reports of the convention were read by Francis Low and Mamie Ruth Harris after which all joined in a "Treasure Hunt". The grand prizes were baskets filled with an assortment of Monarch Brand foods.

Gertrude Samson, Hermann Hospital, Houston, spent Thanksgiving with her parents in Lubbock.

The course for administrative dietitians offered at the University of Texas under the direction of Rosalie Godfrey, has been approved by the national Association.

Members of the state group to attend the national meeting in Richmond, were: Nell Wickliff, Ft. Sam Houston; Nell Morris, Denton; Selma Streit, Rosalie Godfrey and Anna Jansen, Austin; Elizabeth Atkerson, Dallas; Francis Low and Mamie Ruth Harris, Houston.

The Dallas Dietetic Association at its reassembly meeting, October 11, had an attendance of thirty-six. Elizabeth Atkerson, chief dietitian of Parkland Hospital, discussed "Acid-

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build up

a thin child

Cocomalt, the *protective food drink,* has helped so many thousand children . . . adults, too . . . to gain normal weight, that dietitians everywhere are recommending it. And with good reason.

Each ounce—enough for one serving of Cocomalt—is fortified with .15 gram Calcium, .16 gram Phosphorus, as well as *extra* proteins and carbohydrates. And, to aid in the utilization of calcium and phosphorus, each ounce of Cocomalt also contains 81 U.S.P. Units of Vitamin D, derived from natural oils and biologically tested for potency.

Cocomalt is fortified with Iron, too. Each ounce being enriched with 5 milligrams of effective Iron biologically tested for assimilation. This, leading authorities agree, is enough Iron to supply ⅓ of the daily requirements of the normal patient.

Cocomalt may be taken either Hot or Cold. It's delicious, creamy flavor appeals to old and young alike. Inexpensive, Cocomalt is sold at grocery and drug stores in ½-lb., 1-lb. and the economical 5-lb. hospital size purity-sealed cans.

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Pure natural flavors of excellent quality supply the taste, variety the serving value.

Sugar content controllable.

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JULLICUM being liquid only a moment's stirring is necessary to mix.

Large servers profit by its simple method.

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Meticulous handling is not so necessary with Jullicum Desserts; they hold up well, carry well.

LOW COSTS

Before Flavored Jullicum was created your costs were more.

FLAVORED JULLICUM costs less than 1 cent for each 4 ounce serving.

PLAIN JULLICUM costs less than ½ cent to congeal 1 pint milk.

Packed one dozen to the case, $1.25 pint. Assorted to order.

Express or freight prepaid.

Almond	Butterscotch	Caramel
Chocolate	Coffee	Orange
Raspberry	Vanilla	Wine (New Flavor)

Samples to members

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Plain Jullicum, formerly Shinn-Kirk Liquid Rennet, is the oldest Rennet product in America; it has been sold by the Drug and Fancy Grocery trades since 1857.

Ash Diet in the Treatment of Pyelitis with Mandalic Acid", a subject presented later at Richmond. The other speakers were: Mary Pritchett, director of the Home Economics Department of S.M.U.; and Dr. Ercel S. Eppright, director of Home Economics Department of T. S. C. W.

Ruth Clark, former Dallas County home demonstration agent, was married in August to Ellis Strain of Lancaster. The newly appointed agent is Doris Leggitt, and her assistant, Orene McClellan.

Mrs. Dorothea McCormick has resigned as dietitian of St. Paul's Hospital and was succeeded by Hilma Severson of Minneapolis.

Jo Beth Arledge left Medical Arts Hospital to continue her studies at Texas State College for Women at Denton. Pearl Carlisle, now dietitian at Medical Arts Hospital, is a graduate of Southern Methodist University.

Mert McCollum resigned as dietitian of Rushing Clinic and Sanitarium and accepted a position as dietitian of Forest Avenue High School lunchroom.

Delores Strauss left Methodist Hospital at Ft. Worth and is now at Wichita Falls Clinic and Hospital.

Dean Traylor left Baylor Hospital and is now manager of a school lunchroom at Tyler, Texas. She was succeeded by Margaret Ball, a graduate of Michael Reese Hospital and Texas State College for Women.

Effie Seitz, a former assistant dietitian at Methodist Hospital, has opened a tearoom in Tucson, Arizona, which she has called "Katalina." Another assistant, Miss Cavin, has entered the University of Minnesota. Louise Nickell, a graduate of the University of Texas, is the newly appointed assistant.

Lorraine Warnken left Scottish Rite Hospital to enter Western Reserve at Cleveland for graduate study. Pauline Butler from San Antonio YMCA is now dietitian at Scottish Rite.

Catherine Longhridge, a graduate of Texas Technological College, Lubbock, has been appointed dietitian at the Adamson High School lunchroom. She was formerly attached to the Overton public schools.

Juanita Chance, a graduate of Texas Technological College is now dietitian at Trinity Heights School lunchroom.

Lorraine Sanders has returned from a tour of South America and has accepted the office of treasurer of the Dallas Dietetic Association, a vacancy caused by the resignation of Lorraine Warnken.

Johnie McCreary, head of the Foods and Nutrition Department at Texas Technological College, spent an interesting summer in Palestine, Syria, and Southern Europe.

Georgia Mae Smith, who was graduated from Texas Technological College in 1936, is in charge of the foods unit at St. John's College, Annapolis, Md., after completing a year of apprenticeship at International House, Chicago.

Marjorie Granberry, a 1936 graduate, is financial director for a tearoom in Coral Gables, Florida.

Mozelle Craddock, head of the institutional management at Texas Technological College, gave a talk on "Low Cost Meals" at the American Home Economics Association, Kansas City meeting.

Mary Leidigh, former assistant dietitian at the Women's Dormitory of Texas Technological College, is now head of the Home Economics Department of Panhandle College, Goodwell, Oklahoma.

Margaret Anderson is assistant dietitian at Sanatorium, Carlsbad, Texas.

Plans are being made for a dietetic association in West Texas.

Enrollment in the Home Economics Division at Texas Technological College increased 33 per cent last fall.

Marie Wolf, the first student to receive a Master of Arts degree in foods and nutrition from Texas Technological College, has been granted a fellowship to work with Dr. Mary Swartz Rose, Teachers College, Columbia University. She is working toward the doctor's degree in nutrition.

Literature and News from Commercial Firms. *Mead Johnson & Company* calls attention to the importance of vitamin D during the winter months when sunshine averages 10 to 50 per cent less than summer sunshine. The quality of available sunshine is inferior due to the shorter distance of the sun from the earth, altering the angle of the sun's rays. At 8.30 A.M. there is an average loss of over 31 per cent and at 3.30 P.M., over 21 per cent. Another factor here is the additional clothing worn and the limited amount of skin surface exposed to the sun. While admitting that neither Mead's Oleum

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No Cloudy Glasses—No Scale
In Spite of Hard Water

Wyandotte "KEEGO" Cleaner removes food stains in the ordinary process of washing dishes, whether the water is soft or very hard. Dipping or scouring dishes is no longer necessary.

Glasses come through clean, glittering—without towel-ing. No trouble with drop marks or scale.

In spite of very hard water your dish and glass washing machines remain free of scale—when "KEEGO" works for you.

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"KEEGO" is the culinary cleaner un-excelled. It softens calcium and magnesium "hardness" without a precipitate or sediment, thus preventing the formation of scale on glasses or in the machine. In fact, scale is gradually dissolved and removed from the machine during regular operation. "KEEGO" is economical. Packed in 100 lb. plywood drums—350 lb. barrels.

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Percomorphum nor Mead's Cod Liver Oil Fortified with Percomorph Liver Oil constitute a substitute for sunshine, they do offer an effective controllable supplement to the supply of vitamin D, of which such a limited amount is available in ordinary food.

Hoffman-La Roche have released reprints on the value of histamine in the treatment of chronic arthritis, by Albert G. Young, M.D., Ph.D. of the Boston University Medical School.

The same firm announces the recent formation of The Roche-Organon Company, equipped to manufacture and distribute hormone products in America. They believe that developments in the field of endocrine research will have far reaching practical importance and that the future of therapeutic progress is largely tied up with advancement in our knowledge of endocrine physiology and the proper therapeutic use of hormone preparations. Some of these products manufactured under the trade name Organon are the estrogenic hormones; the synthetic male sex hormone; the gonadotropic hormone of pregnancy urine; the vital hormone of the adrenal cortex; and antianemic liver and stomach preparations of high potency and purity.

The *National Live Stock and Meat Board* of 407 South Dearborn Street, Chicago, now have available excellent food value charts useful for teaching and priced at 40 cents. A booklet showing these charts in black and white is available upon request. Other material distributed by the Board are helpful booklets showing the place of meat in menu planning and in reducing menus; nutrition and the importance of meat, meat recipes and other folders on weight gaining, diet in pregnancy, diet in dental diseases and the child's diet.

The *Wisconsin Alumni Research Foundation* have issued a booklet on vitamin D and the teeth with condensed abstracts from dental literature and other charts, circulars and lesson plans concerned with the vitamins. Mrs. Wenger, educational director for the foundation, has arranged several health plays suitable for various student levels to aid the teacher in her presentation of lessons on the vitamins.

Ralston Purina Company are continuing the distribution of descriptive booklets of their products and have included a helpful circular on the low calorie diet.

The *Hawaiian Pineapple Company*, 215 Market Street, San Francisco, through their home economist, Patricia Collier, are distributing recipes for the use of pineapple on cards suitable for filing.

Irradiated Evaporated Milk Institute of Chicago, in addition to their booklet on child feeding reviewed in this issue, have other interesting circulars and booklets available, emphasizing the use of irradiated evaporated milk in the diet, and have included many excellent recipes. An especially interesting folder is that entitled "Potatoes Go With Milk". Another details the importance of milk for better teeth.

Rennet helps to make milk more easily digested

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"JUNKET" Rennet Powder

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Vanilla Chocolate Lemon
Orange Raspberry Maple

"JUNKET" Rennet Tablets

• Not sweetened or flavored—add sugar and flavor to taste. More economical for making rennet-custards and other easily digested milk foods, including whey and protein milk for infants, invalids and convalescents. Also for making smoother ice cream with less cream in hand freezers. Cartons of 12 packages containing 10 rennet tablets each.

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• Flavored, but not sweetened. For making rennet-custards, easily digested milk foods, and smoother ice cream with less cream in hand freezers. Cases of 12 pint bottles. Four flavors or unflavored:

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These delightful milk desserts may be made in endless variety, without baking or boiling, and in only 3 minutes. Light, easily digested, and nutritious, they are widely used in diets for infants, convalescents and invalids, and in many special diets. Especially delicious and easy to make with

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WHO'S WHO IN THIS ISSUE

James S. McLester, M.D., is professor of medicine at the University of Alabama and past president of the American Medical Association. Dr. McLester was commanding officer of Evacuation Hospital No. 20 during the World War. He is well known for his researches and scientific articles dealing chiefly with diseases of nutrition and metabolism. Some of his books are *Nutrition and Diet in Health and Disease* and *The Diagnosis and Treatment of Disorders of Metabolism*, and he has also contributed to *Oxford Medicine* and Cecil's *Practice of Medicine*. At the 1937 Annual Meeting of the American Dietetic Association, the Executive Committee elected Dr. McLester to honorary membership.

E. V. McCollum, Ph.D., Yale, Sc.D., University of Cincinnati, needs little introduction to dietitians, for he has received nation-wide as well as world-wide fame for his investigations in nutrition, especially concerning the vitamins and minerals and as originator of the now much repeated phrase, "protective foods". Since 1917 he has served as professor of biochemistry in the School of Hygiene and Public Health, Johns Hopkins University. Dr. McCollum was a member of the international committee on vitamin standards of the League of Nations for 1931 and also serves on the Technical Commission of the Health Committee of the League of Nations, working on problems of nutrition. Among his professional affiliations Dr. McCollum is a member of the American Society of Biological Chemists (of which he is a past president), the American Chemical Society, the American Academy for Social Sciences, the American Dietetic Association (of which he is an honorary member) and the Harvey Society, of which he is also an honorary member. Of his many writings, the books *The Newer Knowledge of Nutrition* and *Foods, Nutrition and Health*, of which he is senior author, are perhaps best known.

Chas. Gordon Heyd, M.D., is a noted surgeon of New York City and a past president of the American Medical Association. Since 1920 he has been professor of surgery at the New York Post-Graduate Medical School and Hospital. During the World War Dr. Heyd was the commanding officer of Mobile Hospital No. 7 of the A.E.F. He is a fellow of the American College of Surgeons and of the American Association of Gastroenterologists. In 1932 Dr. Heyd was decorated with the Legion of Honor (France).

Lenna F. Cooper, President of the American Dietetic Association, was noted editorially in this JOURNAL for November, 1937.

Grace Washburn is research dietitian in the Department of Pediatrics, Indiana University Medical Center, Indianapolis. Miss Washburn is a graduate of Purdue University, Lafayette, Indiana, where she received the B.S. degree in 1930 and M.S. in 1935. She is a graduate of the student dietitian training course at Indiana University Medical Center under Lute Troutt.